American Fruit Grower Magazine for July

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THERE IS NEED for assurance to the existing fruit shipping organizations that the operation of the Farm Relief Law will not turn out to be destructive, or at least embarrassing to the interests of these associations. A highly prized export market is being developed for American fruits, particularly for apples, by some of these associations.

Yet it appears entirely possible, under the operation of the Farm Relief Law, for a group of interests sufficiently powerful to organize a "dumping" corporation which might in a very short time entirely destroy this prized market. This danger could easily be assured against by the appointment to the Farm Board of a sound Fruit Association man. Some man, for instance, of the type of Charles [illegible] Teague.

IN THE TARIFF hearings before the Senate Finance Committee, spokesmen for the farm groups have repeatedly called attention to the inequality of the agricultural duties compared to the industrial duties in the Hawley-Smoot Tariff Bill now under consideration.

Hawley-Smoot Tariff Bill Impotent to Aid Agriculture

Chester H. Gray of the American Farm Bureau Federation has been particularly outspoken in condemning the injustices to Agriculture in the present bill. He pointed out that the average rate on agricultural products has been increased only 4.05 per cent or from an average of 25.85 to 29.9 per cent, whereas the proposed duties on manufactured products represent an average increase of 5.04 per cent, representing an increase from 42.03 to 47.07 per cent average duties.

Nor is that all of the inequality. Duties on manufactured products are generally wholly effective. And it must be borne in mind that manufactured or processed agricultural products are manufactured products. Fresh fruit is a product of agriculture. Delivered to the dock of the cannery or dehydrator, it becomes the raw material of industry. What benefits accrue to it from the tariff beyond that point are pocketed by the canner or dehydrator.

In the light of the findings thus far of the University of Wisconsin economists, it is doubtful if the proposed 29.90 average rate of duty on farm products will result in as much as 10 per cent average effectiveness.

The fact that prices on many farm crops are set in the world market makes it certain that many of the increases in the Hawley-Smoot bill will be wholly ineffective. Little more than gestures of good will toward Agriculture on the part of Congress.

Nor is Congress unwilling to do more. A previous session elected to give the Equalization Fee a trial. One president vetoed it. His successor practically promised to do likewise, if elected.

In the late session, our conservative "elder statesmen" in the Senate were willing to have tried the Export Debenture plan. Except for the certainty of another presidential veto, the House, safe to say, would have concurred. Either plan would serve to make more effective the tariff on farm products and would give to Agriculture a larger measure of that general prosperity supposed to spring forth from the protective tariff.

Economists have argued for and against both proposals. Arguments in favor of giving either plan a trial have elemental soundness. But the argument of a President containing the words, "I hereby return, without my signature—" has thus far proved the most potent.

The only effective arguments against a Presidential veto are enough votes in the House and Senate, and the courage to use them.

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FRUIT and VEGETABLE SCHEDULES In the Hawley-Smoot TARIFF

An Interesting Sketch of the Efforts Put Forth on Behalf of the Fruit and Vegetable Growers in the Hearings on Tariff Readjustment in Washington During the 1929 Session of Congress

By A. M. LOOMIS and ELMER E. REYNOLDS

REPRESENTATION of special interests such as agriculture is a six-days-a-week, year-around grind. It requires the patient garnering and sifting of facts, the adjusting and compromising of conflicting interests between the various groups, and the final construction of a strong general program upon which all can unite for presentation to the proper Congressional Committee.

These committees want *facts* that will aid them in framing legislation. Oratory gets nowhere. Woe to the special pleader who neglects his facts, for when he appears before the committee he is in for a grilling, or "razzing." Sometimes both.

The months immediately preceding sessions in which the Tariff, or Farm Relief, is up for consideration is the golden opportunity for the self-chosen "leader" with a pet measure. He sends out an urgent appeal to groups he seeks to represent, setting forth the vital necessity for a new "organization" to represent their interests before Congress. That the majority of these groups reply that they have been well represented for years, thank you, deters him not at all. He will get at least a few of the unaffiliated groups for a nucleus.

Then the formation of an organization with an impressive name and the appointment of a board of directors, usually really big men, selected for their standing in their various communities. Unattached groups can usually be depended upon for a small donation to any cause that sounds workable, especially when given an impressive talk. With this list of "member organizations" the representative is ready for business.

But disillusionment usually awaits him in Washington. He finds the majority of the interests along his chosen line are very well represented. They have been at work for months, or years, have reconciled their differences with other farm groups and have agreed with them on a fairly complete program. His usual recourse then is to adopt this program, sometimes with a few changes, as his own, and hurry it into print, ready to claim credit for whatever may be accomplished and laying the blame for the failure of his pet measure to some insidious "lobby."

Legislation in Washington is always the outcome of compromise and adjustment between economic needs and votes. Whether we approve of this condition or not, it must be recognized as a feature of the democratic form of government. To present both aspects to Congress in a way to get results means careful planning and united effort for long periods of time, and covering wide sections of the country. Therefore, large, permanent organizations in agriculture are necessary to secure any real results. This is especially true in the struggle now going on to get adequate and effective duties on fruits and vegetables.

Allied Organizations Co-operate

Several weeks prior to the opening of the hearings on tariff readjustment before the House Ways and Means Committee, Washington representatives of the National Grange, American Farm Bureau Federation and allied organizations began the work of preparing a tariff revision program covering every item in the agricultural schedules.

Conferences were held at which representatives of the Vegetable Growers' Association of America, the American Fruit and Vegetable Shippers' Association, Southern Tariff Association, the large co-operatives and many other organizations primarily interested in fruits and vegetables were called in to discuss the various items and reach an agreement on the tariff increases that should be asked for on fruits and vegetables.

As a result of this co-operative effort inaugurated by the National Grange and American Farm Bureau Federation, a complete program of tariff adjustment was agreed upon. Thus these organizations were prepared to go before the committee asking for practically the same increases in all agricultural schedules, including fruits and vegetables.

This program was presented to the Ways and Means Committee by Chester Gray and W. R. Ogg of the American Farm Bureau Federation; L. J. Taber and Fred Brenckman of the National Grange; A. M. Loomis, representing 50 organizations of growers and shippers of southern fruits and vegetables, and other spokesmen for the hundred or more organizations representing the fruit and vegetable industries.

The only increase proposed in the duty on apples was from 2 cents to 4 cents a pound on the desiccated or evaporated product, and also on apples otherwise prepared.

On apricots a rate of 2 cents per pound, but not less than 40 per cent ad valorem was asked; dried apricots, 4 cents per pound, but not less than 45 per cent ad valorem; berries, 2 cents per pound, but not less than 40 per cent ad valorem; dried berries 4 cents per pound, but not less than 45 per cent ad valorem; cherries, fresh, 4 cents per pound; sulphured or in brine, unpitted, 8 cents per pound; pitted, 13 cents per pound; Maraschino cherries, 14 cents per pound.

On cider a duty of 15 cents per gallon was proposed; vinegar, 20 cents per gallon; figs, fresh, 2¾ cents per pound, but not less than 40 per cent ad valorem; dried or in brine, 7 cents per pound, but not less than 45 per cents ad valorem; figs, prepared or preserved, 12 cents per pound, but not less than 50 per cent ad valorem; dates, 2¾ cents per pound, but not less than 40 per cent ad valorem; dates, dried or in brine, 7 cents per pound, but not less than 45 per cent ad valorem; prepared, 12 cents per pound, but not less than 50 per cent ad valorem; grapes, 40 per cent ad valorem; raisins, 4 cents per pound, but not less than 45 per cent ad valorem; currants, 4 cents per pound, but not less than 45 per cent ad valorem.

A rate on lemons and limes of 2½ cents per pound, but not less than 45 per cent ad valorem, was asked; oranges, 2 cents per pound, but not less than 45 per cent ad valorem; grapefruit, 2 cents per pound, but not less than 45 per cent ad valorem; olives, 30 cents per gallon; peaches and pears, 1 cent per pound, but not less than 40 per cent ad valorem; peaches and pears, dessicated or evaporated, or otherwise prepared, 4 cents per pound, but not less than 50 per cent ad valorem; plums, prunes and prunelles, 1½ cents per pound, but not less than 40 per cent ad valorem; dried, 4 cents per pound, but not less than 40 per cent ad valorem.

The vegetable schedule prepared by the allied agricultural and horticultural groups covered a wide range of tariff increases, including 3½ cents per pound on dried beans; peas, dried, 3½ cents per pound; split or prepared in any manner, 4 cents per pound; onions, 2½ cents per pound; Irish potatoes, 1 cent per pound; tomatoes, 3 cents per pound; tomato paste, 50 per cent ad valorem; canned, 60 per cent ad valorem; turnips, parsnips, carrots and salsify; 1 cent per pound; cabbage, 1 cent per pound, but not less than 50 per cent ad valorem.

The organizations representing the southern producers and shippers of winter vegetables asked for 4 cents per pound on fresh tomatoes, green beans and peas, celery, lettuce, egg plant, beets and spinach; 3 cents per pound on cucumbers, cauliflowers, squash, carrots and parsnips, onions and strawberries; 15 cents per pound on avocados and papayas and 5 cents on mangoes.

Tariff Rates on Cherries Endorsed

The tariff rates on cherries as recommended by the allied organizations were indorsed in statements before the Ways and Means Committee by Egbert A. Smith, Napa, Calif., representing the cherry growers of California, Idaho, Washington and Oregon; J. R. Field, Emmett, Idaho, representing the northwestern cherry growers; W. S. Nelson, representing the associated cherry growers of Wasco county, Oregon; Chester Gray of the American Farm Bureau Federation; Fred Brenckman of the National Grange, and several other organization leaders. It was shown in the briefs presented that imports of cherries from Italy are 15,000,000 pounds annually. E. S. Briggs of the American Fruit and Vegetable Shippers Association also appeared before the committee urging the increase of cherries favored by the Pacific Coast growers.

The California Vineyardist Association, stressing the increasing importations of grapes from Argentina, asked that fresh grapes when packed in sawdust or other packing material, be assessed a duty of $1 per cubic foot of measurement of container or 5 cents per pound, including the weight of the container.

Citrus Industry Represented

Charles C. Teague, of Santa Paula, Calif., representing the California Citrus League, was active in demonstrating to the committee the necessity for increases in the rates on lemons, oranges and grapefruit. He asked for the 2½ cent per pound rate on lemons and limes.

To W. J. Howey, representing the Florida Citrus Exchange, must be given credit for making an effective effort to secure adequate tariff protection on oranges and grapefruit.

A brief was filed by C. E. Durst of the National Horticultural Council. Except in a few minor points, it was identical with that presented by the American Farm Bureau Federation earlier in the hearings.

Increases Obtained

I have presented at some length what the general farm and fruit and vegetable organizations asked for in tariff rates on fruit and vegetables in the new tariff adjustment act. Here is what they got in the Hawley tariff bill which with some amendments has passed the House of Representatives.

There are no increases in the rates on apples and apple products. Apricots were given a rate of 2 cents per pound, but not less than 35 per cent ad valorem; dried, 2 cents per pound; otherwise prepared, 35 per cent ad valorem; berries, 1¼ cents per pound; dried, 2½ cents per pound; otherwise prepared, 35 per cent ad valorem; cherries, 2 cents per pound; sulphured or in brine, with pits, 5½ cents per pound; with pits removed, 9½ cents per pound; cider, 5 cents per gallon; vinegar, 6 cents per gallon; figs, dried or in brine, 2 cents per pound; prepared, 35 per cent ad valorem; dates, unpitted, 1 cent per pound; pitted, 35 per cent ad valorem.

Lemons and limes were given a rate of 2 cents per pound; oranges, 1 cent per pound; grapefruit, 1½ cents per pound; grapes, 25 cents per cubic foot; raisins, 2 cents per pound; currants, 2 cents per pound; peaches, ½ cent per pound; dried, 35 per cent ad valorem; plums, prunes and prunelles, ½ cent per pound; pears, ½ cent per pound; dried, 2 cents per pound; all jellies, jams, marmalades and fruit butters, 35 per cent ad valorem; all other fruits not especially provided for, 35 per cent ad valorem.

In the vegetable list, green beans were given a duty of 3½ cents per pound; dried, 2½ cents per pound; in brine or otherwise prepared, 3 cents per pound; mushrooms, 60 per cent ad valorem; peas, green, 2 cents per pound; dried, 1¾ cents per pound; split, 2½ cents per pound; onions, 1¾ cents per pound; Irish potatoes, 75 cents per 100 pounds; tomatoes, (To Page 10)

EDITOR'S NOTE

With this issue we introduce to our readers two new contributors to the columns of AMERICAN FRUIT GROWER MAGAZINE.

Mr. Loomis will be remembered by many of our old subscribers as a regular contributor to THE FRUIT GROWER of St. Joseph, Mo., before its amalgamation with this magazine. Later, he became Editor of THE GRAPE BELT at Dunkirk, N. Y. He acted as special advisor for the Florida Fruit and Vegetable Associations in the tariff fight and represented the interests of more than fifty southern associations in several states.

Mr. Reynolds was for years Editor of RURAL LIFE of Rochester, N. Y. After his retirement from that publication, he entered the news-reporting field in Washington, D. C., and is now one of the best known agricultural news writers at the national capital.

We hope to present additional stories from these two able writers on developments in Washington relating to the Fruit Industry.

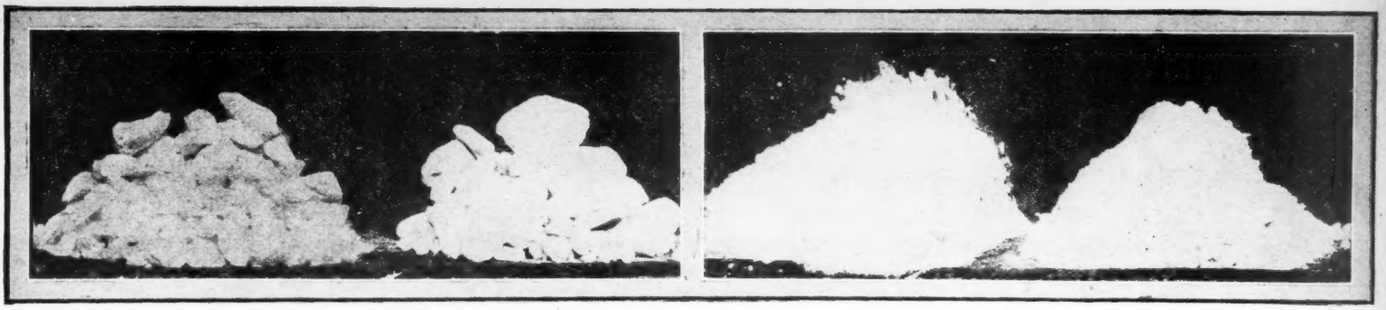
"SEND FOR THE RECORD"

The full text of all briefs, evidence and arguments submitted to the Ways and Means Committee of the House of Representatives on all agricultural proposals will be found in Official Record which is sent free on request.

Write to Clayton F. Moore, Clerk, Ways and Means Committee, House of Representatives, Washington, D. C., and ask for Volumes 7 and 15, Hearings, Tariff Readjustment, 1929.

Volume 7 contains all the records on "Schedule 7," comprising the Agricultural Products. Volume 15 covers the "Free List." All information, briefs, evidence and argument on tariff provisions affecting agricultural products will be found in these two volumes, which are fully indexed. They provide very interesting reading.

XUM



Materials Used in Making Old-Style Bordeaux
Bluestone (copper sulphate) crystals and lumps of quick lime have been used since 1882 in making Bordeaux.

Materials Used in Making "Instant Bordeaux"
Powdered bluestone "Snow" and chemical hydrated lime make a superior mixture in less time.

"INSTANT BORDEAUX"--A BETTER COPPER SPRAY

By F. J. SCHNEIDERHAN
Virginia Experiment Station

Chemical Hydrated Lime and Powdered Bluestone "Snow." Require No Special Equipment. Entering Into Solution While Tank Is Being Filled, They Make a Uniform, Stable Mixture of High Effectiveness and Safety Such as Is Difficult to Secure with the Older Materials.

IN 1882 the French grape growers were in the habit of spraying grapes with verdigris to repel the small boys who pilfered the grapes. When Millardet, the great plant pathologist, visited the section near Medoc, he noticed that grapes sprayed with this copper compound showed much less downy mildew infection than unsprayed grapes. This accidental observation and the subsequent research on the copper and lime combination by Millardet resulted in the development of our well known Bordeaux mixture.

Previous to 1906 when Cordley of Oregon and Piper of Washington demonstrated the effectiveness of lime-sulphur as a summer spray, Bordeaux was practically the only widely used summer fungicide for fruits. A study of the spray calendars from the fruit growing states today reveals that lime-sulphur is in quite general use as an early summer spray material while Bordeaux is used for the late summer sprays.

The writer, who has been in close touch with fruit growers in the Shenandoah apple belt during the past seven years, has observed that the use of Bordeaux has been decreasing. Two main reasons for this decreasing use of Bordeaux have been found, the first and most important one being the difficulty of preparing Bordeaux according to methods in vogue at present, and secondly, the apple growers have suffered losses resulting from Bordeaux injury of various types.

Three years of study to develop an easier method of preparing Bordeaux have resulted in what we have designated "instant Bordeaux," so called because it is prepared in the time normally required to fill a spray tank with water.

The Old Method of Preparing Bordeaux and Its Difficulties

To date, crystals of copper sulphate and quick lime have been used in stock solutions to prepare Bordeaux. We shall not go into the details of this method because they are too well known. The equipment to prepare these stock solutions ranges from two barrels, one each for the lime and copper sulphate, to special Bordeaux mixture plants in which large tanks are so connected with pipes as to enable the copper sulphate and lime mixtures to flow simultaneously through a common pipe into the spray tank. Such a spray mixing plant is shown in Figure 2.

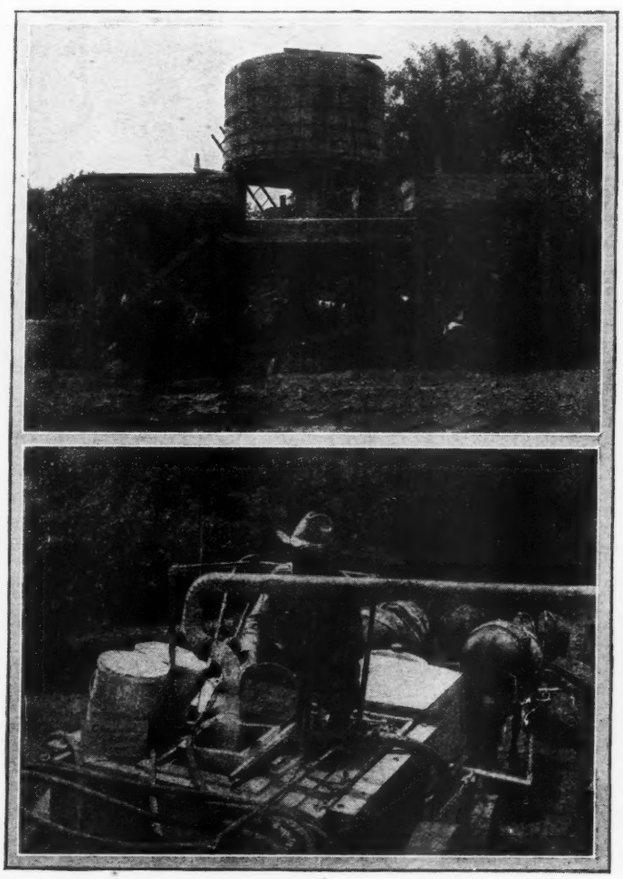
If careful attention is given to the preparation of Bordeaux from quick lime and bluestone crystals, excellent spray material will result, but there are several inherent difficulties connected with the use of quick lime which have been the chief stumbling blocks to proper Bordeaux preparation. Very few apple growers know how to properly slake lime. For that matter, quite a number of so-called experiment station experts do not know how to properly slake lime. Every lime chemist will tell you that slaking lime is a trick, and they prove this by pointing to the fact that in the manufacture of hydrated lime, water is added to quick lime by a special pump synchronized with the lime conveyor so that exactly the proper amount of water is added to a certain amount of lime.

The average orchard hand uses either too small an amount of water or else too much. In the first instance he "burns" the lime and in the second he "drowns" it. The product resulting from both errors is quite unfit for Bordeaux preparation.

Very few of our apple growers properly strain the milk of lime resulting from the slaking and addition of water, the result being the introduction of gritty material and coarse particles into the spray tank. Around these coarse particles the bluestone solution lays down a layer or several layers of material which enlarges the particles, setting up the most common cause of tank strainer and nozzle clogging. Furthermore, this gritty material propelled at high pressure against leaves and fruit causes mechanical injury rarely found after applying properly prepared Bordeaux. There is a wide variation in the quality of quick lime, as a perusal of the chemical analyses from many lime companies will indicate.

All of these factors militate against the preparation of good Bordeaux. Furthermore, hardly any two growers add the ingredients of Bordeaux in the same sequence and the result is a wide variation in the quality and composition of the Bordeaux used in our orchards.

The trouble with the old method of making this fungicide is that it is not fool-proof and we are certain that many of the abuses heaped upon Bordeaux as a fungicide are due to improper preparation. From the hundreds of questions asked us at our laboratory we feel convinced that for years back there has been an urgent need for a simple, effective, fool-proof and standardized method of preparing Bordeaux mixture. The writer has, as previously remarked, studied this problem during the past three years and will now describe briefly the new method which results in the so-called "instant Bordeaux."



A Comparison in Equipment Required

Figure 2. (Above.) An up-to-date Bordeaux mixture plant in an orchard near Winchester, Va. Water in the center tank, lime and copper solutions respectively in the flat side tanks, which are connected by the pipe shown in front, through which the two solutions are run simultaneously into the spray tank. Figure 3. (Below.) In the preparation of "instant Bordeaux" this cumbersome and expensive equipment is unnecessary, three pails, a scoop and kitchen scales sufficing for the preparation of 300 gallons of "instant Bordeaux" in five minutes—or while the tank is being filled with water.

The New Method of Bordeaux Preparation

In this new method, stock solutions and all former equipment are eliminated. Instead of quick lime and crystals of bluestone, chemical hydrated lime and powdered bluestone are substituted. Chemical hydrated lime is an extremely fine hydrate, so-called because it has been used largely in the chemical industries. It has a high active lime (CaO) content, the maximum being between 70 and 75 per cent. This lime usually has a low magnesium oxide content and is so fine that approximately 99 per cent of it will pass through a 330-mesh sieve.

Ordinary plastering or agricultural hydrate usually contains approximately 45 to 55 per cent of active lime and much more magnesium than the chemical hydrate. Furthermore it is much coarser, only 90 per cent passing through a 200-mesh sieve. Chemical hydrate retails for the same price as finishing lime and is very much better suited for making Bordeaux. This type of lime is prepared by an air flotation process which gives it its fineness. It is manifest that a material as fine as this lime will react chemically in a very effective manner.

Powdered bluestone, known to the trade as "snow," is the other ingredient used in this new process of making Bordeaux. This material is of a fineness comparable to finely granulated sugar, and actual solubility tests indicate that it will dissolve in cold water properly agitated within two minutes. The price of this powdered bluestone is only a trifle more per pound than the crystals of bluestone.

Both of these Bordeaux ingredients can be stored indefinitely in a dry place, and the only equipment necessary to prepare Bordeaux is a few buckets, a scoop and a kitchen scale. In the picture at the top of this page is shown the materials used to prepare Bordeaux according to the old and new methods.

(*To Page* 16)

This pine mouse doesn't look ferocious, but his race is responsible for most of the six million dollar loss.

FIELD MICE COST SIX MILLION DOLLARS

Eastern Growers Find the Extension of Sod Mulch System of Orchard Soil Management Intensifies Damage from Rodents. In Eastern States Alone the Damage Is in Excess of $6,000,000 a Year.

By JAMES SILVER
United States Biological Survey

A GROWING TENDENCY toward sod orchards in large apple growing sections east of the Mississippi has aggravated the field mouse situation in recent years. Losses have been particularly severe during the past two winters and many growers are seriously concerned with the problem. Just how many apple trees in the aggregate are killed or injured by these rodents each year is a question often asked but never answered. To get an answer with any degree of accuracy would require a careful and costly survey—a study that apparently no individual or organization is at present in a position to undertake. A reasonable estimate is now possible, however, as the result of accumulated data at hand.

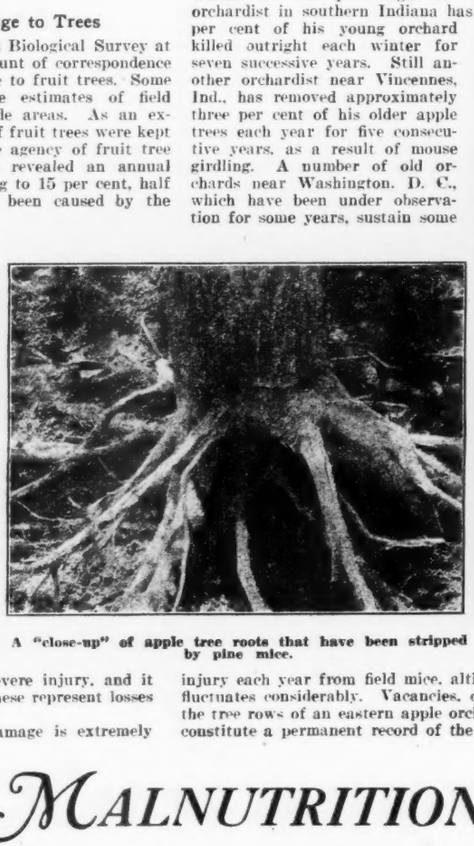
Some Figures on Damage to Trees

In the files of the United States Biological Survey at Washington, D. C., is a large amount of correspondence and reports on field mouse damage to fruit trees. Some of these reports include reliable estimates of field mouse damage over relatively wide areas. As an example, records of a large number of fruit trees were kept in the state of Maine through the agency of fruit tree growing contests. These records revealed an annual mortality of young trees amounting to 15 per cent, half of which was estimated to have been caused by the work of field mice.

During the "mouse year" of 1919-20 extensive observations revealed that nearly three per cent of the fruit trees of the state of Connecticut had been girdled by mice, representing a loss of about half a million dollars. Some individual orchards lost as high as 60 to 75 per cent of the total number of trees at this time. A questionnaire was sent out to fruit growers of Massachusetts during the same "epidemic" and returns indicated a loss totaling $125,000 in orchard trees in that State.

Similar county-wide surveys have revealed losses amounting to hundreds of thousands of dollars during a single winter. A very large number of records of heavy losses in individual orchards are also available. Complaints of injury by field mice, as well as surveys by public officials, are usually made following years of more than usually severe injury, and it is recognized that compilation of these represent losses considerably greater than average.

In many orchards field mice damage is extremely erratic. Little or no mouse damage for a number of years is apt to be followed by a year of most serious injury. On the other hand, many orchardists report more or less constant damage from year to year. One orchardist of the Shenandoah Valley of Virginia reports that he bridge grafted approximately 200 old trees each winter for the past eight or 10 years. Another orchardist in southern Indiana has had from six to 10 per cent of his young orchard killed outright each winter for seven successive years. Still another orchardist near Vincennes, Ind., has removed approximately three per cent of his older apple trees each year for five consecutive years, as a result of mouse girdling. A number of old orchards near Washington, D. C., which have been under observation for some years, sustain some injury each year from field mice, although the intensity fluctuates considerably. Vacancies, or younger trees in the tree rows of an eastern apple orchard nearly always constitute a permanent record of the work of field mice during the life of the orchard because a large percentage of all trees dying are the direct or indirect result of mouse injury.



A "close-up" of apple tree roots that have been stripped by pine mice.

Much potential loss is averted by bridge grafting.

All fruit growing sections are not equally susceptible to field mouse depredations. Some good orchards are located on soil types not favorable to the burrowing habits of field mice and losses are negligible. Most of the large apple producing areas of the East and Mid-West, however, are seriously involved.

On the basis of data available, it seems conservative to estimate that two per cent of the apple trees of the States east of the Mississippi River and north of the Ohio River, and including all States along the Atlantic seaboard from North Carolina northward are injured more or less by field mice each year. Of this number it is estimated that 20 per cent die and 80 per cent recover. The area being considered has approximately 80,000,000 apple trees, which means 1,600,000 trees are injured annually by field mice and of these 320,000 die and 1,280,000 recover.

Assuming that the average apple tree has a value of $10, the dead trees represent an annual loss to the apple grower of over $3,000,000. This is only half the story, however, for the remaining 80 per cent of the injured trees are saved either by the expensive process of bridge grafting or they recover more slowly without assistance, which involves a lessened production for several seasons. One dollar per injured tree is a very conservative estimate of the cost of grafting, plus loss from lessened production. It will run the total amount of the loss, however, up to nearly $4,500,000.

There is also a vast amount of lesser injury, such as the cuting of smaller roots, constantly in progress, which has no measurable effect on the tree or production of apples, but which, nevertheless, retards the maximum development of the tree and its fruit. This loss is too intangible to be considered in the estimate, but it doubtless plays its part in fixing the margin between profit and loss for the orchard.

The cost of combating the mice represents a definite outlay of funds to a large percentage of apple growers and should be included in the estimate of loss occasioned by the mice. Possibly 30 per cent of the apple growers of this region follow the practice of (*To Page* 17)

MALNUTRITION in PLANTS

Some Apparent Nutritional Disorders of Fruit Trees in Arid Regions, Due to Excess of Nitrogen Accumulating in Autumn, May Be Alleviated by Planting Legumes in Orchard.

By F. J. SIEVERS
Massachusetts Experiment Station. (Formerly Professor of Soils, Washington State College)

NUTRITION PROBLEMS are quite as common in plant life as they are in animal life, and in both cases these problems become most evident where the living organism is forced to develop under unnatural environmental conditions. In plant life when plants are fed artificially, many disorders are common and recognized, and these disorders are most evident in plants when their culture is attempted under climatic and soil conditions to which they are not naturally adapted.

The orchard industry as practiced in the more or less arid sections, both with and without irrigation, furnishes an outstanding illustration of this fact. In nature, orchard trees are best adapted to humid regions having a soil comparatively well supplied with organic matter and nitrogen, and where the precipitation is so distributed as to cause the plant food in the soil to become available through bacterial action in about the proper amount and proportion to meet the demands of the growing plant. When attempts are made to grow such trees in the arid regions where soils are primarily not abundantly supplied with organic matter and nitrogen and where moisture must be furnished either by irrigation or by conservation through clean cultivation, nature's influences are decidedly modified.

A Nutritional "Disease"

Among the apparent nutritional disorders of orchard trees in the arid regions the "disease" sometimes referred to as "roseatte," or "small leaf," or "die back," or "mottled leaf," or "multiple bud," is quite common. Its main symptom is that large numbers of small leaves develop in clusters in a more or less roseatted arrangement on the ends of twigs. Cultural indications are that soil nitrogen is a contributing factor to this abnormal condition.

The influence of available nitrogen on the development of some of our annual plants is fairly well understood. For instance, large supplies of soluble nitrogen when present in the soil during the tillering stage of wheat will cause the plant to set many stools; when present after the jointing stage they result in luxuriant vegetative growth; and during the fruitation stage their tendency is to produce a grain high in protein.

While the influence of nitrogen in the development of a perennial plant like an orchard tree is not so easily traceable, and therefore, not so well understood, it is only reasonable to suppose that such influences may be quite as evident and prove quite as effective once it is learned how they may be detected. Using the "disease" referred to as an illustration of a case of malnutrition, let us see what the conditions are under which it develops and the practices that have been effective in its control, so that a proper basis for a diagnosis may be established.

This roseatted condition develops under both irrigated and non-irrigated conditions in the more arid sections of the State of Washington where trees are grown under clean cultivation. When this "disease," which interfered so materially with the production of marketable fruit that it made the business unprofitable, was first experienced, the more radical growers pulled up their orchards and resorted to the production of other crops from which the required returns could be derived. The more conservative orchardist left his trees but attempted to grow a crop between the rows. Alfalfa was known to be well adapted and it was introduced.

This crop not only proved fairly profitable, but to the grower's surprise the orchard trees took on a deeper green foliage, made a more luxuriant leaf and wood growth and the roseatted condition rapidly disappeared. The natural effect of this beneficial (*To Page* 11)

WHO CONSUMES OUR FRUIT CROPS?

An Interesting Analysis of the Ultimate Destinations of American Fruit Crops. Showing Importations and Exportations in Comparison with Proportion of Crops Consumed in America.

By KING H. GRAYSON

Consulting Research Engineer

OVER four hundred billion pounds of America's choicest fruits were picked and packed in the orchards of this nation in 1926; still, more than one hundred and fifty millions more had to be imported from foreign lands, not including Hawaii or other American colonies, to satisfy the craving for fruits on the part of our citizens. An analysis of who is consuming the vast production of America's orchards brings forth many interesting sidelights. The results of England's "Eat More Fruit" campaign are easily seen; and now Sweden has started with a similar program. Just what this means in fruit consumption and dollars to American orchardists and fruit canners can best be seen from a survey of Table I, which shows America's three best customers for each of our fruits.

Fruit Exports Increasing

Canada and Great Britain are our two greatest customers for citrus fruits, and were it not for the Italian lemon orchards, the United States would undoubtedly secure England's heavy trade in the third citrus item which the English people consume in large quantities. German consumption of citrus fruit is on the increase and promises great potentialities for the producers of oranges and grapefruit. This is true in a lesser way with China, where a large increase in buying may be expected in the next five years. Apples, on account of transportation and warehousing, bring a large amount of trade to this country, as is shown in Table II.

The fact that foreign tastes for American fruits is considerably on the increase is easily seen by a comparison between 1918 and 1926. Our total shipments of lemons abroad in 1918 amounted to 193,347 boxes, at a value of $1,088,823, or about on a par with the shipments to Canada alone in 1926-27. This is also true of oranges, which our neighbor to the North consumed in quantities almost three times more than our total foreign shipments of 1918. The increase in America's apple trade has been tremendous. In 1918 our total exports amounted to 529,916 barrels, at a value of $3,135,203, one fourth of England's consumption in barrels during 1926-27. Canada now buys more pears than the total exports of 1918, and this is true of peaches and plums.

Prunes are a favorite breakfast dish in England according to their purchases of dried and evaporated fruits; and the Germans and Dutch must be exceptionally fond of dried apple pie, as is indicated by Table III.

Canada was our second best customer for dried and evaporated fruits from the standpoint of total quantity of all fruits, but it was not one of the large consumers, with the exception of raisins.

Germany purchased nearly five times as many dried apples in 1926 as the total exports of 1918. This was also true of Holland; while Germany and Holland together consumed 1,000,000 pounds more of apricots than were shipped from America in 1918. What peaches have lost in popularity is more than offset by the fact that Germany alone purchased 6,000,000 pounds more of prunes than the total export of this fruit in 1918; while France more than equaled it and Great Britain almost doubled it.

The growth of trade in canned fruits and preserves deserves its share of recognition, and in this line of food products it is very evident that such campaigns as that recently held in England can bring only good returns to our industry.

Majority of Canned Fruits Go to Great Britain

A study of Table IV indicates that the Englishman is still very fond of his compotes made from canned American apricots, peaches, pears and pineapples. It also causes one to wonder why the Chinese and Javanese are so prominent as purchasers of our cherries. Cocktails must still be in great demand in that corner of the world; and a sweet-tooth is also developing in Panama. On the other hand, we are forced to purchase a few fruits to satisfy American tastes for things which we either do not produce or which seemingly taste better when imported, as shown in Table V.

Heavy American fruit crops and light crops from the orchards of Europe resulted in favorable export conditions in 1926 for the fresh products but in enforced lower prices on dried and evaporated fruits. The campaigns in England and Sweden were originated by health officials, and the results were plainly apparent during the period of Great Britain's test. Fruit is one of the staples of the American diet, and while it is to be hoped that foreign peoples will create an appetite for our products, it is certain that very heavy foreign buying, despite America's gigantic production, will have a tendency to increase the prices at home, particularly if greater transportation facilities at fruit seasons are not available to move the perishable crops, of which there is seemingly an orchard surplus each year due to this one factor.

An analysis of America's fruit imports is equal to a lesson in geography. The dates from England are evidently an export of an imported product because none are grown in the British Isles. This is also true of the figs from Holland. It is difficult to reconcile oranges from Japan and Cuba; or grapes from Argentine or Chile when one thinks of the expansive orchards of California. Italian cherries are evidently very popular and apparently Javanese are not the only ones still interested in the bottled variety which makes cocktails popular.

The people of the United States are still America's best customers for the products of her orchards, and regardless of how great foreign consumption may become, it seems certain that it will never equal that of this country. The orchardists and canners should rejoice at the growth of the trade, however, because it offers many potential markets for canned goods from crops which cannot be moved to consuming centers due to car shortages. Such development would offset many heartaches which the fruit growers have suffered in years gone by, causing many of them to lose their farms and orchards when markets for fresh fruits were impossible for several years in succession.

A greater growth of foreign trade would have a tendency to increase fruit orchards and berry planting more than any consuming condition on the home markets. It is to be hoped, therefore, that other nations will soon follow in the path of Sweden's "At Mer Frukt."

While this study of foreign markets for fruit is fresh in mind, it may not be out of place to give thought to the condition of the domestic market for fresh fruits.

The same means used abroad to stimulate a heavier consumption of fruits could not fail to have a similar effect at home.

Some years ago an "Eat More Fruit" movement was inaugurated by the American Pomological Society, and gave promise of accomplishing much good. Were that society as effective in carrying out wonderful ideas as it is in creating them the Eat More Fruit campaign would have been carried to a successful stage of development.

Voluntary contributions from persons directly or indirectly interested in promoting the sale of fruit carried the expense of the work.

A "clip-sheet" was mailed to every newspaper and magazine each month, containing seasonable fruit recipes, short items calculated to direct the reader's attention to the value of fruit as a food, and occasional contributions from such noted dietetic experts as Dr. J. H. Kellogg, who treated the subject from the standpoint of promoting habits of health for the general public.

Prominent among those who shouldered the work of gathering material for this service were Professors Roy Van Meter of Massachusetts Agricultural College, and Harold B. Tukey of the Geneva, New York, Experiment Station. The amount of this valuable matter that was reprinted by the press in general was formidable. While there is no way of computing or even of estimating the actual results accomplished, it is probable the boldest guess was an underestimation.

Whether this movement could be revieved is a question worthy of thought. It filled a place in supplying fruit propaganda to the general public that has not since been filled. Its revival would benefit the fruit grower, the fruit shipper and the general public.

Table I. Total Fruits Exported 1926-27

Twelve months: $129,718,000

FRUIT	DESTINATION.	QUANTITY.	VALUE.
Grape fruit	Canada	228,430 Bxs.	$ 817,899
	Great Britain	157,580 "	826,409
	Germany	3,268 "	20,324
Lemons	Canada	242,729 "	1,010,870
	China	14,971 "	83,116
	Japan	10,757 "	58,736
Oranges	Canada	2,273,290 "	9,518,802
	Great Britain	233,785 "	966,886
	China	48,400 "	248,239

Table II.

FRUIT	DESTINATION.	QUANTITY.	VALUE.
Pineapples	Canada	58,555 Bxs.	$ 193,586
	Great Britain	351 "	1,632
Apples	Great Britain	3,350,097 "	7,603,259
		2,411,307 Bbls.	12,069,026
	Germany	854,316 Bxs.	1,846,136
	Canada	694,848 "	1,046,846
		132,217 Bbls.	409,318
	Argentina	120,233 "	510,400

(America's production of citrus fruits and apples in 1926 was over 275,000,000,000 pounds; our foreign customers above consumed nearly 900,000,000 pounds of it.)

	DESTINATION.	QUANTITY.	VALUE.
Berries	Canada	8,424,137 Lbs.	$872,224
	Great Britain	234,962 "	17,819
	New Foundland	47,000 "	3,602
Grapes	Canada	21,561,128 "	961,444
	Cuba	4,655,999 "	202,951
	Mexico	1,696,626 "	92,640
Pears	Great Britain	30,033,279 "	1,665,503
	Canada	25,933,324 "	961,342
	Brazil	4,310,905 "	483,531
Peaches	Canada	13,250,344 "	445,010
	Great Britain	400,582 "	28,811
	Cuba	388,511 "	19,618

Table III.

FRUIT	DESTINATION.	QUANTITY.	VALUE.
Total dried	Great Britain	44,922,763 Lbs.	$3,594,814
Raisins	Canada	36,808,318 "	2,612,092
	Germany	15,888,211 "	1,381,318
Apples	Germany	9,918,572 "	1,098,625
	Holland	9,027,127 "	928,081
	Sweden	2,398,469 "	243,267
Apricots	Germany	3,964,068 "	833,545
	Holland	2,769,836 "	580,214
	Denmark	2,008,484 "	429,186
Peaches	Great Britain	1,599,762 "	218,666
	Germany	1,250,184 "	177,265
	Sweden	854,774 "	127,589
Prunes	Great Britain	41,471,325 "	3,120,522
	Germany	28,887,658 "	1,544,816
	France	22,915,202 "	1,493,794

Table IV.

FRUIT	DESTINATION.	QUANTITY.	VALUE.
Apples	Great Britain	13,232,504 Lbs.	$ 877,173
	Irish Free State	326,437 "	21,457
	Holland	147,574 "	10,780
Apricots	Great Britain	26,790,260 "	2,664,802
	Canada	1,245,046 "	138,857
	France	1,208,178 "	115,835
Cherries	Canada	265,215 "	43,105
	China	256,281 "	38,508
	Java	213,840 "	32,736
Prunes	Great Britain	941,157 "	87,100
	Mexico	381,731 "	45,305
	British India	364,694 "	48,568
Peaches	Great Britain	53,003,195 "	5,180,262
	Canada	4,021,407 "	413,772
	Cuba	1,966,299 "	200,610
Pears	Great Britain	44,634,891 "	4,694,017
	Cuba	1,430,743 "	182,993
	Canada	970,737 "	118,391
Pineapple	Great Britain	10,271,624 "	994,128
	Canada	5,422,127 "	540,882
	Germany	5,289,665 "	506,260
Preserves and Jellies	Canada	488,698 "	85,107
	Great Britain	297,596 "	52,919
	Panama	184,937 "	27,303

Table V. (Imports of Fruit)

FRUIT	SOURCE OF SUPPLY.	QUANTITY.	AMT. PAID.
Bananas	Jamaica	13,905,643 Bu.	$6,556,947
	Honduras	12,967,325 "	6,409,929
	Costa Rica	6,114,711 "	3,046,644
Grape fruit	Cuba	17,656,036 Lbs.	530,007
	Mexico	113,970 "	3,661
Lemons	Italy	73,771,406 "	1,697,731
	Canada	80,596 "	2,121
	France	46,640 "	584
Oranges	Japan	825,858 "	46,229
	Cuba	88,490 "	1,679
Limes	British West Indies	3,063,251 "	77,518
	Mexico	724,263 "	20,407
	Dominican Republic	649,860 "	15,465
Pineapples	Costa Rica	1,285,733 "	287,115
	British Malaya	1,251,002 "	94,313
	Cuba	216,340 "	21,999
Berries	Canada	5,286,252 "	445,105
	New Foundland	375,175 "	29,739
	Holland	52,502 "	4,807
Cherries	Italy	2,667,097 "	264,164
(Natural state)	Canada	494,803 "	58,054
	Chile	21,200 "	3,376
Cherries	Italy	18,747,173 "	1,970,750
(Preserved)	France	605,882 "	115,413
	Germany	133,860 "	13,358
Grapes	Argentina	58,413 Cu. ft.	140,620
	Belgium	24,968 "	153,830
	Chile	10,485 "	28,097
Currants	Greece	12,772,286 Lbs.	697,590
	Italy	412,000 "	22,822
	Australia	64,400 "	5,568
Dates	Arabia	32,429,767 "	1,635,165
	Iraq	10,401,143 "	547,875
	Great Britain	3,347,682 "	151,969
Figs	Turkey	22,388,168 "	2,009,461
	Greece	7,248,425 "	328,546
	Holland	6,567,736 "	262,029

FRUIT CROP PROSPECTS for 1929

The General Outlook

By PAUL FROELICH
U. S. D. A.

"Higher returns depend largely upon better grading and packing. Uniformly good quality stimulates consumption and demand. The brand or label that always represents uniformly good quality usually reaps the benefits."

THE JUNE report on fruit prospects indicates considerably lighter crops of most fruits than last year. The strawberry season was waning, and Florida citrus was about done. Peaches were beginning to move freely from Georgia, but shipments this season will be light.

General Prospects

As fruits were still in bloom along parts of the northern border on the first of June, it was too early to forecast accurately what the production in the northern States will be, but the indications are that fruit crops in the country as a whole will be substantially less than usual. The condition of fruits is particularly low in California and Florida, and nowhere does the fruit crop seem very heavy. The production of apples, peaches, citrus fruits, prunes and grapes will probably be below the average of recent years.

Apples: In western New York, Michigan, the Ozark region, Kansas and Nebraska, the apple crop is expected to be larger than that harvested last year, but in nearly all other States the crop promises to be smaller. In the country as a whole the apple crop seems likely to average 10 per cent less than that of last year, but still substantially larger than the light crop of 1927. The condition of apples on June 1 was reported as about 67 per cent, compared with 72 last year and the average of 68 during the previous 10 years. Only three States—Maine, Vermont and Wyoming—show condition above 90 per cent. Washington reports 76 per cent, as against 85 last year, and West Virginia 48 per cent, compared with 64 per cent in 1928.

Peaches: The condition of peaches on June 1 averaged 55 per cent, compared with 73 per cent on June 1 last year and the average of 64 per cent during the previous 10 years. California, the leading producing State, seems likely to have the smallest peach crop in 10 years. Georgia, which ranks next in importance, promises to have the smallest crop since 1920. Ohio also reports a very short peach crop. Elsewhere conditions are more favorable, and the probable production in the United States is estimated at 48,759,000 bushels. This will represent a substantial reduction from the 68,374,000 bushels produced in 1928, but will be a slightly better crop than that of 1927.

Early Rose peaches were bringing $2.25-$3.25 per crate in southern Georgia during the forepart of June. The commercial peach crop in Georgia will be very light. Early estimates are for slightly less than 10,000 cars this season, compared with shipments of nearly 16,000 last year and approximately 12,000 cars in 1927. Compared with the 1928 movement, a decrease of 3300 cars is expected in southern Georgia and a decrease of 3000 cars in the central part of the State. North Georgia will ship only slightly fewer cars than last season. Movement of Hileys and Elbertas may be only 55 per cent of last year's output of these varieties. Only 4800 cars of Elbertas and 2100 cars of Hileys are expected.

Pears: Reports on the condition of pears indicate prospects somewhat poorer than usual. In Washington and Oregon, where the number of pear trees of bearing age has been increasing rapidly, the production may be up to the average of the last few years. California and New York both expect light crops, and elsewhere crop prospects are only fair. June 1 conditions indicate a crop of 20,663,000 bushels, compared with the 23,783,000 bushels harvested last year. The condition of the pear crop on June 1 was 58.5 per cent compared with 70 last year and an average of 65.5 during the previous 10 years.

Citrus Fruits: In both California and Florida, the reported condition of citrus crops on June 1 approached the low condition reported in June, 1927. Present prospects are decidedly less favorable in both these States than on June 1 last year, and the reported condition of all citrus fruits in these States is well below the usual average. Prospects are, however, much more favorable in Texas and Arizona, where the condition of citrus fruits averages about 90 per cent of normal.

Cherries: The condition of cherries in New York was reported as 62 per cent. Condition in certain other important States was reported as follows: Michigan, 67; Wisconsin, 68; Montana, 79; Idaho, 86; Utah, 73; Washington, 71; Oregon, 60; and California, 50.

Prunes: The June 1 condition of California prunes for drying was 42 per cent, compared with 71 on June 1, 1928, and a 10-year average condition of 72 per cent. The production is forecast at 128,000 tons, as against an estimated production (revised) in 1928 of 220,300 tons. The condition of Washington prunes for drying was reported as 76 per cent and prunes for marketing fresh, 84 per cent. The condition of Idaho fresh prunes was given as 90 per cent of normal.

Standardization Popular

Various States have official standards for the packing and inspection of certain fruits and vegetables. In a large number of producing areas, the Federal grades are adopted as the basis for standardization. Much progress in this line of work has been made during the past 10 or 12 years by the United States Department of Agriculture, and, at present, recommended Federal standards or grades are available for 14 fruits and 33 vegetables. The fruits are as follows: Apples, apricots, sweet cherries, citrus fruit, dewberries and blackberries, eastern grapes, western grapes, peaches, pears, pineapples, plums and prunes, and strawberries.

Higher returns depend largely upon better grading and packing. Uniformly good quality stimulates consumption and demand. The brand or label that always represents uniformly good quality usually reaps the benefit.

Standard grades properly and consistently used promote honesty and fair dealing, and discourage the careless and unscrupulous packer. They enable the conscientious grower and shipper to realize a premium for care, honesty and good judgment. They provide a common language with which to describe quality, condition, maturity, size and all the factors that determine the value of a given shipment. They serve as a convenient, fair and equitable basis for sales and for contracts covering future transactions, for quotations to buyers, for inspection of the product at shipping points and in receiving markets, for adjustment of claims, for co-operative pooling, for financing, and for the reporting and intelligent comparison of market prices.

Grades for Cannery Products

Official grades recently have been prepared for apples intended to be sliced and canned, as well as for apples used in the commercial manufacture of sauce. At a May meeting of New York canners, held in Rochester, the firms represented handle about 85 per cent of the apples used for canning purposes in that State. They expressed great interest in the plan of having definite grades for cannery apples, and approved the tentative specifications. Several members of the association applied for Federal-State inspection at their canneries the coming autumn. It is believed that the experimental measures adopted this year will lead later to a widespread use of these Federal grades for cannery apples.

Four canners of apples in Pennsylvania expect to contract with growers this coming season on the basis of the United States standards, and have requested inspection at their canneries. The Federal grades were approved at a meeting in Biglerville. The Pennsylvania Bureau of Markets previously did some work along this line and, during the 1928 season, inspected and classified approximately 2,284,000 pounds of apples, 5,653,000 pounds grapes, and 905,000 pounds of tomatoes for cannery use. Federal grades for cannery tomatoes are being used at a number of plants in various parts of the country.

The 1928-29 season for apples was about finished, and summer fruit of the new season was beginning to appear in the markets. Storage holdings cleaned up remarkably well. Shipments of the 1928 crop finally totaled about 128,000 cars, or 35,000 more than the carlot movement of 1927 apples. The past season's output came very close to the estimate of 127,029 cars, made in December. During early June, the weekly movement of this fruit still averaged around 200 cars. The season was remarkable for stability of prices. Fluctuations were not great nor frequent.

Reports from commercial cold storage plants on June 1 indicated only 107,000 barrels, 633,000 boxes and 218,000 bushel baskets of apples remaining under refrigeration. The supply of fruit in barrels was 11.5 per cent less than a year ago and about 54 per cent less than the June 1 average for the past five seasons. Boxed apples were in 48 per cent lighter supply than last spring and 32 per cent less than the average holdings for this time of the year. Bushel baskets were slightly less plentiful than on June 1, 1928, but were 70 per cent above average. The combined holdings in cold storage were 35 per cent less than a year ago and about 33 per cent below the average figure. No more reports of apples in cold storage will be issued this season. The next report will be as of October 1.

Europe As an Outlet

The United Kingdom has been, for years, a favorite market for American deciduous fruits and citrus fruits. But the continental markets of Europe have been rapidly expanding. Germany particularly has taken more apples than ever before. Returning from a tour of European countries, a representative of the Department of Agriculture reported that "the European markets for American fruits doubtless will be maintained. In spite of the tendency of some countries to increase their production of certain fruits. Russia is a growing competitor in European fruit markets, although shipments have not yet reached large, competitive proportions, except possibly in the apple markets of Sweden."

There were liberal offerings of American apples at recent Hamburg auctions, and prices declined somewhat. Decay was appearing in some arrivals.

Reports indicate that the winter killing of fruit trees in continental Europe during the past season has been above normal, but not as great as was expected earlier in the year. It is still too early for a definite report on the effects of the severe winter weather, but plums, apricots and peaches seem to have suffered more than apples and pears. The most frequent complaints are from Poland and Czechoslovakia. In Germany, Austria and Switzerland, recent reports are more favorable than those of the early part of the season, and the prune trees of Yugoslavia have evidently wintered satisfactorily.

Blossoming was not yet finished in most parts of the continent and in the northern sections had not yet begun. The blossoming of prunes and apples in Yugoslavia has been heavy and the outlook for these crops is reported to be favorable, although scale is expected to cause same damage in Bosnia. Pears have blossomed fairly well in Czechoslovakia. In southern Tyrol, apple blossoming has been fairly good and pear blossoming good. Apples, pears, and plums are reported generally good in Germany.

Consumption of American dried prunes is developing more and more in France, the excellence of the pack and the uniformity and dependability of the article having won for it increasing favor.

British Columbia Prospects

A consular report from British Columbia says that there will, in all probability, be a shortage of irrigation water in the Okanagan Valley this summer, because of a light snowfall on the surrounding mountains. The size of the commercial fruit crop in this principal horticultural area of British Columbia, therefore, appeared to depend largely upon rainfall during the month of June. The spring season was late in this region, and apple trees did not blossom until the forepart of May. Reports from various sections of the Okanagan Valley predict not more than an average crop. In the vicinity of Penticton, a decrease of at least 20 per cent below the crop of 1928 is foreseen.

Indications are that the British Columbia cherry crop will be exceptionally heavy. The yield of apricots, peaches, plums and prunes is also expected to be large, and growers anticipate good profits as the result of frost damage to similar fruits in California.

Only an average crop of strawberries was expected, and was scheduled to move to market during early June. Co-operative selling of the British Columbia strawberry crop was abandoned for the 1929 season.

Florida Citrus Season Ended.

Grapefruit will be relatively scare for a few months, since the Florida season has ended. Shipments totaled approximately 22,000 cars, as against 14,165 during the 1927-28 season. Only a couple thousand carloads of grapefruit originate in California, Arizona, Texas and other sections each year, and imported stock arrives from Porto Rico and Cuba.

The past season's movement of Florida oranges was around 32,000 cars, or practically double that of the year before. California has already shipped more than 40,000 cars of oranges, compared with 30,000 to the first of June, 1928. Movement of 9000 carloads of mixed citrus fruit from Florida was 3000 above the preceding season's record.

Strawberries About Done

Shipments of strawberries after June are very light and are limited to producing sections in such northern and western States as New York, Massachusetts, Michigan, Wisconsin, Utah, Montana, Washington and Oregon. It appeared that the season total might exceed slightly the 18,715 cars moved during 1928. By June 1, the carlot supply was 2500 cars ahead of last season's record to the same time and shipments still averaged 300 cars daily. However, a rapid decrease of movement was expected in early June. The late strawberry sections have a crop eight per cent heavier than that of last year.

The commercial strawberry crop as a whole went to market earlier than anticipated. Peak shipments of 2875 cars were reported during the week ending May 18 instead of two weeks later, as is usually the case. Possibly most of the shortage in mid-season movement occurred in Missouri. That state was estimated to have a considerably larger crop than in 1928, but total shipments were expected to fall below the 1928 record. The Missouri season proved somewhat disappointing to growers. Returns to growers in the Middle West and in eastern producing districts about June 1 ranged only $2-$3 per crate. Some recovery of prices was looked for during June.

The State Reports

California

June 17.—Nothing of importance has transpired during the past month to change our statement with regard to fruit prospects in this State from that reported a month ago. We have had some rain, totaling probably an inch during the past 10 days. This is quite unusual. However, practically all the cherries were harvested and consequently little damage was done. There is some mildew showing up on peaches. How much damage it may do we cannot state at the present time. I do not look for it to be of any considerable importance. In general this season is 10 days to two weeks later than normal.

Cannery prices for apricots and peaches have not as yet been set. The growers are asking $80 a ton for canning peaches. Whether or not they will be successful in this respect remains to be seen.—*Warren P. Tufts.*

Colorado

June 19.—At present in the northern part of the State the sour cherry crop promises to be an exceptionally full one. All varieties are carrying a heavy set of fruit and in some cases the early varieties have commenced to ripen. Picking will start in this section about July 15 and the majority of the fruit will be marketed on a contract basis to the canning factories. The price will be close to six cents per pound. At present there are no serious diseases or insects that will affect the yield of the crop.

On the western slope of Colorado, the Elberta peach crop in the Palisade district promises to be an exceptionally heavy one. There is an unusually heavy set of fruit on all peach trees and a slight increase in the number of trees in bearing. In the section from Austin to Paonia there will be a considerable decrease in the yield of the peaches, due to losses suffered from winter killing. While the Palisade section will produce an unusually large crop, the reduction in the yield on the North Fork district will

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The SOUTH WATER MARKET

By W. H. HALL, United States Department of Agriculture

Some Problems of Peach Marketing

THIS particular phase of the peach industry is chosen for this article because it is believed that the subject of marketing receives entirely too little study. Problems incident to successful growing are, of course, important, but it is believed that the basic principles of growing are better understood than those of marketing. Fifteen or 20 years ago this statement would undoubtedly have been challenged, especially if applied to sections that have sprung into prominence during that period. Among such sections may be mentioned southern Illinois, southern Indiana, southwestern Michigan and portions of Arkansas, Oklahoma and Tennessee.

Southern Illinois perhaps offers the outstanding example of progress in peach growing among the states mentioned. Union county, the heaviest producer, 20 years ago had practically no strictly first class peach orchards. Most of the orchards were of two, three or five-acre tracts, made up of four or five varieties, some of which were little known. What little bark the rabbits did not gnaw off during the winter stood a good chance of being finished the following spring by the plowman. Spraying and pruning were little known. As a result, few good peaches came out of this section.

Today, there are hundreds of excellent peach orchards in Union county, as well as in the other important peach counties throughout the southern part of the state. Unfortunately, the marketing problems appear to have received less thought than those of growing, or at any rate, this phase of the industry has lagged behind.

Peach Movement Now Under Way

Early varieties of peaches are now moving from Georgia in moderate volume, and shipments from this State will be heavy within the next two or three weeks. Other States making up the bulk of Elberta movement will start shipping in July and will continue until late October. So this commodity for the next four months will occupy a very prominent place among other fruits.

The harvesting and marketing of peaches does not essentially differ from that of other fruits and vegetables. If anything, the marketing of peaches is fraught with greater risk than attends the marketing of many of the perishables, chiefly because of the highly perishable nature and the sharp price fluctuations during periods of heavy offerings and unseasonable weather. A few outstanding problems are here pointed out, together with such information as may be of service to growers and shippers.

In these remarks no attempt is made to offer a panacea for all the ills incident to harvesting and marketing, but there are certain fundamentals that should be adhered to and which if disregarded are apt to lead to trouble. These problems are treated in their order of importance, and such suggestions or opinions as are expressed are based on a survey of the industry as a whole rather than on any particular market or group of markets.

Has Production Reached Saturation Point?

We are prone to hide behind the age old excuse "If" in an endeavor to answer this question. Peaches are produced commercially in about 31 states, California and Georgia furnishing more than one-half of the total carlot shipments. A survey of production figures over a period of 20 years reveals no decided tendency up or down, when the entire area of the United States is considered, also growth in population. However, this much is certain (and perhaps herein lies at least a partial answer), that during years of heavy production prices are almost invariably low—often ruinously low—especially for those states distant from terminal markets. It is doubtful if the average grower could survive several consecutive seasons of 60,000,000 bushels total production, which, with present acreage, is not only possible but probable.

There is a saturation point in fruit production, just the same as in other lines of industry, and it seems to be rather generally agreed that peach production comes dangerously close to being in this class, if not actually in it. If this is true, it becomes a subject of paramount importance, because this situation cannot be remedied by any existing law. The solution, therefore, must be sought elsewhere. It will be found only in the fullest co-operation of those who are responsible for the condition—the growers. Individual effort will be of little avail, but with the tendency towards co-operative marketing, the problem is made less difficult. No individual or organization

(*To Page Fifteen*)

Dollar-Making Experiences in High Speed Farm Transportation

READER, NOTE: This is the fourth of a series of Fruit and Produce Growers' Personal Experiences, relating to the Profit Side of high-speed haulage, which should be of especial interest to those who recognize the all-important part the SPEEDY MARKETING of farm products plays in making farming PAY.

"We Have 6 Other Trucks But Our Speed Wagon Works Cheaper and Adds 20% to Our Profits!"

EFFICIENT operation, more savings, more profits—that's what made us purchase a Reo. We traded in one of the largest make trucks on the market for a 3-ton Reo. We got a good proposition, and so far we have driven this truck 35,000 miles.

"To deliver fruit and vegetables day after day we require a truck of sturdiness and power—in short, a regular-performance article.

"Now, we have six other trucks, and we've kept accurate records on the cost of 65-mile-a-day trips. The Reo works cheaper and makes us at least 20% more on our gross during the period of a year.

"You see, we grow our own fruit and vegetables, and naturally when a load perishes through loss of time caused by faltering motors and slow, sluggish operation, the loss cuts into our net profit, and that's why we are careful when choosing a truck."

Yours very truly,
E. G. MAGILL,
62 North LaSalle St., Aurora, Ill.

A Long Life Record Probably Unequaled in the History of Commercial Transportation

—On July 1, 1928, there were 96,481 Reo Speed Wagons registered in the United States.

—This was 4,756 *more* than had been sold in the United States during the entire previous 6½ years from January 1, 1922, to July 1, 1928.

—93.2% of all the Reo Speed Wagons sold in the United States during the previous 7½ years was still in registered use July 1, 1928.

—80.3% of all the Reo Speed Wagons sold during the previous 8½ years was still in registered use on July 1, 1928.

—50.8% of all Reo trucks sold since 1913 was still in registered use on July 1, 1928.

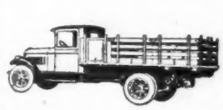
Reo Gold Crown Engine

Specifications: Reo Gold Crown engine — with chrome nickel alloy cylinder block, new type low expansion, longest lasting aluminum pistons, 6 cylinders, seven-bearing crankshaft, and full pressure lubrication. 4-wheel 2-shoe internal hydraulic brakes. Built-in Myers magazine chassis lubrication. Air-cushioned seats. And full equipment. Nine wheelbase sizes — from 134 to 179 inches—in tonnage capacities of 1½, 2 and 3 tons. Priced from $1,295 to $2,200—F. O. B. Lansing, Michigan. *142*

REO LONG LIFE SPEED WAGON

Reo Speed Wagons also in ½ ton and 1 ton models ranging from 115-inch to 138-inch wheelbases. Priced from $895 to $1,075—F. O. B. Lansing, Michigan.

REO MOTOR CAR CO., Lansing, Michigan.



Master Speed Wagon, 2-ton capacity. Platform type body adaptable to all 'round farm use. Husky 6-cylinder engine and 4-wheel (2-shoe) internal hydraulic brakes.

Speed Wagon Tonner with curtained express body. Six cylinders, 4-wheel (2-shoe) internal hydraulic brakes. Handles its capacity load of 2,000 lbs. with ease — swiftly and economically.

14 Sizes to Choose From

Don't expose your throat and lungs to this danger!

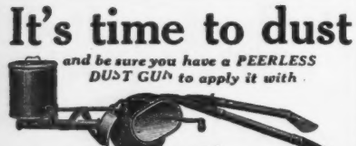
WHEN you work with poisonous fruit sprays, guard against serious injury to your lungs! Don't risk your health. Play safe by wearing a mask.

The Willson Dustite Respirator for Dust and Spray gives you complete protection. Comfortable. Allows free breathing. Wear it when you're treating seed—threshing—or doing any other dusty, irritating work. Recommended by manufacturers of agricultural chemicals. Priced at $2.25. If your dealer can't supply you, write to us direct and we will send it C. O. D. Address Willson Products, Inc., 203 Washington Street, Reading, Pa., U. S. A.

THE WILLSON DUSTITE RESPIRATOR
for Dust and Spray

It's time to dust

and be sure you have a PEERLESS DUST GUN to apply it with



It has stood the test and it's a pleasure to meet the owner of a Peerless.
It is constructed of first class material by skillful workmen. Scientifically designed to produce a maximum of power with a minimum of effort.
It brings results as low plants or medium sized trees are easily reached.
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2 Speed Gear. Single or Twin Engines. Walking or Riding Types.
SPECIAL Offer
Write for full details and special Low Prices. Easterners customers pay freight from Pittsburgh, Pa.
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Insist upon DAISY FLY KILLER from your dealer.
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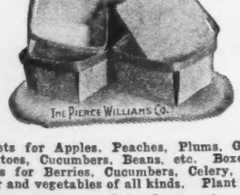

Baskets for Apples, Peaches, Plums, Grapes, Tomatoes, Cucumbers, Beans, etc. Boxes and Crates for Berries, Cucumbers, Celery, Cauliflower and vegetables of all kinds. Plant boxes.
Catalog mailed on request
The Pierce-Williams Co.
South Haven, Mich., or Jonesboro, Ark.

Fruit and Vegetable Tariff Schedules

fresh, 3 cents per pound; prepared in any manner, 25 per cent ad valorem; turnips and rutabagas, 25 cents per 100 pounds; peppers, eggplant and cucumbers, 3 cents per pound; squash, 2 cents per pound.

Banana Tariff Proposed

Some demand appeared for a tariff on bananas. Several resolutions, including one from the Oregon State Legislature, were filed with the Committee in support of the plan, and a spokesman for this proposal was given a hearing. An early admission that the requested duty of 1½ cents a pound would not noticeably increase the cost of bananas to the housewife was unfortunate and the hearing resulted in making no impression on the Committee.

No one appeared before the Committee in opposition to the banana tariff proposal, though some of the apple people, notably Sam Fraser of the Apple Shippers, expressed themselves elsewhere as being far from sold on the idea. But it was fairly evident that the spokesman for the banana tariff had not proved his case by his presentation of the subject, and that this pet plan died of inertia.

That the volume of banana imports presents a problem cannot be denied. The subject demands thoughtful study, and if properly handled and presented to the other farm groups may be made the subject of future adjustment and possible compromise.

The Caribbean countries now supplying America with bananas to the extent of $30,000,000 annually likewise provide a market for over $180,000,000 worth of American agricultural exports, chiefly cereal and meat products and canned goods. General farm interests want to study the proposal to imperil $6 in farm exports for the sake of a dollar's worth of imports. It is also claimed that the banana, with certain citrus fruits, provides a dependable, year-around basic

(*From Page Four*)

business without which fruit stores would find it difficult to exist. And through these fruit stores much of America's seasonal fruits find their way to the consumer.

But the many seemingly sound suggestions such as these have been dismissed as "banana propaganda." And so the matter rests for the present.

While the general farm, fruit and vegetable organization did not get all that they asked for in the House bill they secured substantial increases which should prove highly advantageous to the fruit and vegetable growers in particular and to all the farmers in general. Whatever is lacking in the House bill they have an excellent chance of obtaining in the Senate bill, which is now under consideration by the Senate Finance Committee, provided the United fruit and joint spokesmanship can be continued.

In Co-operation There Is Strength

It would be nonsensical for any individual or organization to claim the credit for the tariff increases on fruits and vegetables. If I were to name the outstanding organizations to whom is due the most credit for these increases I would place in the forefront the National Grange, American Farm Bureau Federation, the Southern Tariff Association and the Vegetable Growers' Association of America.

Referring to the assistance given the commodity organizations by the National Grange and American Farm Bureau Federation in preparing the tariff revision program, S. S. Knight, representative of a California co-operative, says:

"The service which the general farm organizations of the United States render, acting in unison as they are at the present time, and their efforts at the National capital is, in the writer's opinion, the most outstanding service which was ever performed for American farmers by these or any other organization."

It would be difficult to trace to its source the responsibility for each item in the Hawley tariff bill or any other tariff legislation. While an organization representing a commodity may be responsible for enlisting the support of the big national organizations, their success no doubt is due to the co-operative effort of many organizations working together on a single program.

The National Grange and American Farm Bureau Federation have a large share in legislation because they maintain headquarters in Washington, and their representatives are constantly on the job in season and out. They have contacts in Congress and the other departments of the government that no organization can expect to have which sends its representatives to Washington only when the hearings are in progress.

At the headquarters of these organizations conferences are held and plans perfected for legislative campaigns. The latchstring is always out to representatives of other farm and commodity organizations when they come to Washington to attend the hearings, and the advice given by representatives of these organizations, if accepted and acted upon, is often of great assistance to the men who are from a distance and are unacquainted with the ins and outs of legislative procedure.

Practical co-operation of all the groups of farm and commodity organizations, producers, handlers and shippers working in unison in the development of a single program and standing solidly back of that program, will be largely responsible for whatever tariff increases and tariff benefits that may be obtained for the fruit and vegetable growers and allied industries in the new Hawley-Smoot tariff act.

How to Construct a Bank Storage Cellar

By CLARENCE E. BAKER
Purdue Experiment Station

THOSE FAMILIES who have no suitable basement storage facilities or space in their cellar to devote to the construction of a storage room for fruits and vegetables will be interested in a small outdoor storage for home use. Such a storage is frequently called a "side hill pit" or "bank cellar storage" as it generally is constructed in the side of a slope, although this type of location is not a necessity. The cellar may be made in level ground, provided it is thoroughly drained, and the soil removed in digging the cellar may be mounded up about the sides and over the roof to protect it from the heat of the fall sun and the chill of winter.

Construction Material

A side hill pit may be made of wood, but such construction is not recommended, as wood decays rapidly in this type of storage.

Concrete is a very efficient material for constructing the side hill pit. It is permanent, strong and relatively economical. It may be waterproofed in such a way that undesirable moisture may be excluded. If the top is properly reinforced, it may be covered with two feet of soil or more without danger of strain.

Location

A well-drained location should be selected for the erection of the storage cellar. It is not essential that the ground be entirely free from seepage, in fact, a slight seepage of water is more desirable than otherwise, providing the footings are well made and are large enough to support the weight of the walls and roof. It is generally best not to lay a concrete floor in the storage. If the moisture keeps the ground soft or muddy, a slatted false floor supported on concrete sills or piers may be constructed a few inches above the ground. This insures a high humidity, which is very desirable in this type of storage. If a concrete floor is used, troubles from deficient humidity are likely to occur.

It is preferable to face the storage north or northeast by locating it in a bank that slopes in that direction. If such a location is not available, however, any other exposure may be used with satisfactory results.

Size of Building

A small storage suitable for the average farm home is illustrated in the drawing. This building is 12 feet long, eight feet wide and seven feet high, inside measurements. The walls are of concrete eight inches thick, lined with two thicknesses of structural insulation, nailed to furring strips embedded in the concrete. The top is of reinforced concrete seven inches thick. A similarly insulated 16-inch tile placed in an upright position about 18 inches from the rear wall along the central axis of the top slab serves as a warm-air outlet. A tight fitting damper should be made to close this opening when it is not in use and to prevent freezing in cold weather. As an additional precaution, a pile of leaves or straw may be placed over the top of the opening above the ground in severely cold weather.

On level ground, the floor of the building is placed three feet below the surface of the soil. If drainage is necessary, a tile may be laid around the building outside of the walls or footings. Concrete steps lead to the level of the cellar floor from the ground level. In the front end, a tight fitting door two feet six inches by six feet six inches is placed. This door is made of four thicknesses of one-inch material with a layer of heavy, waterproof

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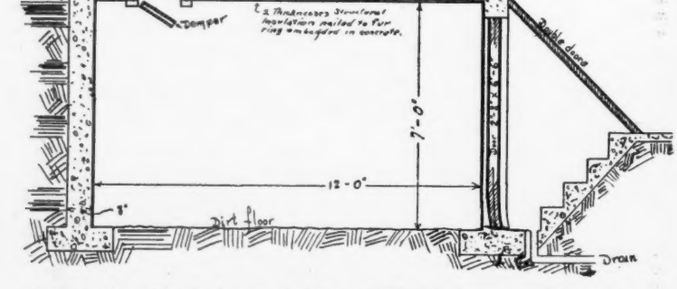


Cross section of bank storage, showing method of drainage, ventilation and insulation.

Malnutrition in Plants

(*From Page Six*)

influence on the trees was that not only alfalfa but other legumes were rapidly introduced in the growing orchards, so that now there is little clean cultivation practiced where the irrigation water supply is adequate to make intercropping possible.

The first reaction from such results might well lead to the conclusion that the beneficial effect of legumes in this relationship is traceable to their nitrogen fixing power, and this is justifiable on the basis that most of the irrigated soils are, even in their virgin state, not overly well supplied with nitrogen.

Where intercropping with legumes was considered impracticable due to prejudice or to the lack of sufficient irrigation water, it was concluded, and reasonably so, that the same benefits could be derived if the trees were supplied with a readily available nitrogen fertilizer. In actual practice, however, this did not follow because it proved that the beneficial results produced by the legume could not always be duplicated in that way. Furthermore, roseatted trees were not always associated with nitrogen deficiency in the soil, because in a few cases trees growing in hog lots where there was every evidence of an adequate nitrogen supply also developed the "disease." Animal manures, on the other hand, when applied to roseatted orchards in liberal amounts were just as effective in overcoming this nutrition problem as were legumes.

Abnormal Supply of Nitrogen in Soil

Although these apparent inconsistencies may be difficult of complete explanation on the basis of actual controlled experimental work, it is reasonable to conclude that the form in which the nitrogen is applied and the time at which the application is made is a very important factor. In the orchard sections of the State of Washington it is not uncommon to have long periods of comparatively warm weather and considerable rainfall after the trees have reached their dormant state in the fall. This warm weather and the optimum soil moisture supply promote nitrifying bacterial activity with the result that in clean cultivated soils where there is no vegetable growth to utilize the nitrogen so made available, large amounts of nitrogen frequently accumulate in the autumn season.

Where the succeeding winter precipitation is not sufficient to cause the accumulated nitrates to be leached into the drainage system, a condition that prevails in most irrigated sections, a comparatively large amount of available nitrogen will be present in the soil and ready to function as soon as the growing season begins in the spring. Such supplies of available soil nitrogen are not possible in the humid climates naturally adapted to tree growth and it is only reasonable to suppose that this abnormal food supply in the spring will produce abnormalities in tree development.

Liberal supplies of available soil nitrogen are conducive to excessive vegetative growth and in the case of trees, nitrates, present in large amounts in the very early spring, may serve as a stimulant for the development of a large number of buds and leaves. When later in the season this supply of nitrates is exhausted, as is likely to be the case with these soils, which are at best not abundantly supplied with total nitrogen, there is no corresponding twig growth and elongation. The result is that the leaves are left in a light green colored, partly developed state, grouped close together near the ends of branches.

The use of a nitrogen fertilizer, instead of overcoming this condition, as was at one time supposed, may even aggravate it if the application is made at the wrong time of the year. Surely it would seem illogical under such conditions to make heavy applications of readily available nitrogen fertilizers in the late fall, winter or early spring.

Limiting the Nitrogen Supply

In orchards where legumes are grown to supply the nitrogen, the situation is different. The conditions that are conducive to the bacterial activity essential for nitrogen fixation by legumes and for the decay of soil organic matter necessary to release nitrogen for plant use, are the same conditions that promote the best tree growth. There should be little danger, therefore, of the accumulation of an abnormal supply of available nitrogen, under conditions where that element of plant food is supplied by legumes or by slow acting organic fertilizers. That this is borne out where legumes are grown has been shown, and it is also known that the roseatted condition does not develop but can be overcome when animal manures are used to supply the nitrogen. The property of manure to supply regular and normal amounts of available nitrogen in the proportion that the growing plant demands them has caused this fertilizer to become known as "fool proof."

When plants are fed with artificially prepared fertilizers of high availability an attempt should be made to apply such fertilizers at the time and in the proportion that they are required if best results are to be obtained, and this is especially true where perennial plants are grown and when the quality of the product is a factor. If these relationships are once properly understood many malnutrition problems can be controlled and commercial fertilizers may be used to exert influence on yield and quality never before credited to or claimed for animal manures.

Visitor (speaking of little boy)—He has his mother's eyes.

Mother—And his father's mouth.

Child—And his brother's pants.

How to Construct a Small Bank Storage

(*From Preceding Page*)

building paper between each thickness, and two thicknesses of structural insulation, such as Celotex on each side. This door is left open for ventilation except in freezing weather or during warm spells in the fall, so a heavy wire mesh screen door or one made of a slatted frame should be provided for protection. Double doors in the form of a "lean-to" may be used at the top of the stairway. These are not essential and may be omitted if one chooses. Their chief value is in keeping trash and snow out of the stairway. If the storage is built in a hillside, the floor may be made on the surface level so that steps are unnecessary.

Plant Shrubs for Protection from Sun

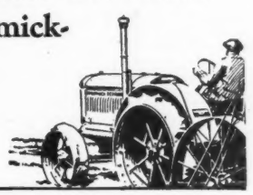
Soil is banked about the finished building covering the sides and top to a depth of at least two feet. If the location of the building is in the direct heat of the sun, it is a good plan to plant shrubbery over the mound, choosing shrubs that make a dense foliage in order to shade the building from the sun's heat.

Numerous storages of this general type are in satisfactory operation and have many uses on the average farm, not only as a storehouse for food for the family, but as a place to store perishable fruit and vegetable commodities in times of a poor market until they may be disposed of to better advantage. In operating such a storage, the principles of operation outlined in the February number of the AMERICAN FRUIT GROWER MAGAZINE should be followed carefully to secure the most satisfaction from the bank storage cellar.

Now there are over

700 Horseless Farmers

***on the* McCormick-Deering list.**



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Ah, Yes!

Customer—Which leather makes the best shoes?

Shoe Salesman—I don't know, but banana skins make the best slippers.

Husband—What are those pans of oil doing in the corners of the room?

Wife—I put them there for the mice. You said it annoyed you to hear them squeak.

New Maturity Standards for Pears

By F. W. ALLEN
University of California

PEARS differ from most other fruits in that if allowed to become fully ripe on the tree, they are of inferior quality. The flesh is more juicy and of better texture if the fruit is picked while still firm and the latter stages of ripening allowed to take place in storage, or at least in a moderately cool place. The fact, however, that pears may be permitted to remain on the tree too long does not justify the conclusion that they should be harvested as soon as they attain a given size.

Formerly Harvested According to Size

Bartlett pears, which constitute three-fourths of the pear planting in California, are grown under a wide diversity of climatic conditions, ranging from the cool, coastal districts to the hot, dry interior valleys. The commercial picking season, or the time of ripening in the various districts, extends over a period of nearly three months. Early shipments of Bartletts have, in the past, been picked according to size. The minimum size for harvesting, however, has been rather elastic and in some instances a good many pears were required to fill a box.

Fruit thus prematurely harvested is of even poorer quality than that allowed to remain on the tree slightly too long. The pears shrivel, the flesh becomes tough and leathery and they materially lack in flavor. Color, ease of separation from the fruit spur, and the general "filling out" of the fruit, are other indexes for harvesting.

These tests are of value, but they are all predicated entirely upon the judgment of the grower. With thousands of growers picking and shipping fruit, it is impossible to expect all of them to be of the same opinion. The shipments have thus shown considerable variation in maturity and the fruit has ripened with various degrees of quality.

Firmness and Color Now Determining Factors

After four years of investigations, two of which were in co-operation with the United States Department of Agriculture, different degrees of firmness and also of color of the fruit have been correlated with dessert and shipping quality. Both holding tests and actual shipping tests were conducted. Except under conditions where the pears assume a pronounced yellow color early in the season, they will unusually fail to ripen satisfactorily where the pressure required to force a five-sixteenths-inch plunger point into the fruit for a like depth exceeds 23 pounds. The highest dessert quality is secured when the fruit tests between 20 and 17 pounds. Bartlett pears testing as low as the latter figure, however, may be slightly too ripe for long distance shipment. A firmness of 20 pounds is nearly ideal for both high dessert and good shipping quality. Where one has a small crop, picking might well be made at this pressure, but with the large tonnage of fruit to be moved, it is necessary for California orchardists to begin harvesting somewhat earlier.

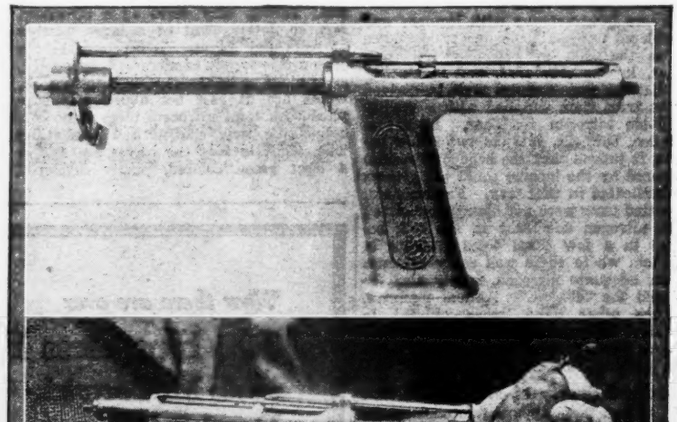
During the past season the California Fruit and Vegetable Standardization Act governing the movement of fresh fruits and vegetables from California, has been materially strengthened. Not only is a minimum size requirement for Bartlett pears specified, but as a result of the above investigations, definite color and firmness standards are also established. The fruit must either have assumed a definite degree of greenish-yellow as indicated by comparison with a standard color chart, or else the firmness of the flesh must not show more than certain designated pressures. All Bartlett pears shipped from California this year must conform to a 23-pound pressure test unless they show, at the time of picking, a distinct yellowish color. Pears showing this degree of color when compared with the standard color chart will ripen with fair quality when testing 25 pounds.

Mechanical Pressure Tester Used

Firmness of the fruit is ascertained by the use of a mechanical fruit pressure tester, operating on the same principle as the familiar thumb test. The mechanical tester enables one to read in pounds on a spring scale the pressure required to force the above mentioned plunger point into the flesh of the fruit. With pears and apples, softening begins much earlier than is generally realized. Determinations made on Bartlett pears show that the texture of the flesh may begin to change even before the fruit has attained full size. Softening in Bartlett pears is also very marked. Samples at picking time have shown a pressure test as high as 30 pounds, whereas such fruit when ready for eating would test only two to three pounds. Although influenced to some extent by climatic and other factors, this softening is fairly uniform throughout the latter part of the development period, the firmness decreasing between two and three pounds in a 10-day period.

The accompanying illustrations show the type of instrument developed at the California Agricultural Experiment Station for determining fruit pressures. This new type of tester is approximately only 10 inches in length, is of very light weight and is provided with a convenient pistol grip handle. In construction it is made of steel and aluminum. The electrical attachment, used on earlier instruments to indicate the point at which the pressure readings should be made, has been replaced by a sliding indicator which operates as pressure is applied to the plunger point. When the plunger point has penetrated the flesh to its full depth, this indicator is even with the end of the sleeve covering the spring, as illustrated.

If desired, the rider attachment may also be used to record the pressure exerted in making the test. The spring within the barrel is of high grade piano wire tested for accuracy on a standard scale. The milled cap or nut immediately preceding the grip of the tester provides for any adjustment in the spring which may subsequently be necessary. This cap is retained in position by a lock screw which prevents its turning.



Above, California pressure tester, used to determine the condition of fruits for picking. Below, method of using the pressure tester.

Since more accurate readings are secured by removing the skin from areas on the fruit to be tested, another feature considered of great convenience is the peeling device beneath and immediately behind the plunger point. This device consists of a removable blade duly protected by a metal bar, which also serves to regulate the depth at which the flesh of the fruit is cut. To avoid variation in individual pears, eight to 10 fruits should be used for a test. Each fruit is tested on opposite sides. After removing the skin from the areas to be tested, the plunger point of the tester is forced into the flesh and the required pressure noted. Individual readings are recorded and averaged and the average pressure secured represents the firmness of the sample.

Such tests are easily and quickly made and furnish the grower an excellent mechanical check upon his personal judgment. They also make possible a definite maturity standard and insure better quality to the consumer.

Orchards Demand Adequate Nitrogen

SPEAKING recently before the Quebec Horticultural Society in Montreal, Prof. J. H. Gourley, chief horticulturist of the Ohio Experimental Station, called attention to the striking demand that orchards make for nitrogen, particularly sod or mulched orchards.

In discussing practical fertilizer practices, based on Ohio conditions, Prof. Gourley said: "Our practice is to apply approximately a quarter of a pound of nitrate of soda for each year of a tree's age, so that a four-year-old tree receives one pound and a 20-year-old tree five pounds. This is broadcast or sown beneath the outer branches."

He called attention to orchard experiments in which complete fertilizers are used in comparison with nitrogen only. "The evidence in favor of the former," he said, "is so meager and unconvincing in most cases as to have led horticulturists generally to confine their recommendations to nitrogen beneath the trees and to phosphorus between the tree rows for the benefit of the grass or cover crop."

As regards quality, Prof. Gourley mentioned experiments in progress which show that "fruit from trees highly fertilized with nitrate of soda has kept as well as that from trees receiving normal treatment."

Those who persist under old systems and old ideas in these modern times soon find themselves in the position of the carriage-maker and buggy-whip manufacturer who refuse to recognize the trends of the times.

Blasting caps look innocent but they are filled with a powerful explosive. They should be kept out of the reach of children.

FRUIT CROP PROSPECTS for 1929

(From Page Eight)

make the total production for the State about normal. Peach harvesting will probably start about August 15. There are no indications of serious losses due to insect and disease injuries.

The apple crop looks as though it would be slightly under the average for the past few years. The most serious insect pest on this crop is the codling moth and various methods of control are being worked on by the Entomology Department to check the losses suffered by the insect injury. Under the direction of Frank List, Deputy State Entomologist, some work has been done on the parasitizing of the codling moth, and while as yet no outstanding results have been secured, the method of control looks somewhat favorable.—*A. M. Binkley.*

Connecticut

June 15.—Apple conditions are rather discouraging at present. Most varieties bloomed satisfactorily, with the exception of McIntosh and Rhode Island Greening. Some growers report less than five per cent McIntosh set, others 30 per cent. In general, the McIntosh crop will be very much less than it was last year. Even with increased size of trees and young trees coming into bearing it is doubtful if the crop will be 50 per cent as large as last year. Rhode Island Greenings are also light, although the condition varies somewhat in different localities and even within the same orchard.

Curculio is very bad and with the smaller set of fruit the proportion of injured fruit is going to be larger than in years past. Apple scab is also very prevalent this year even in orchards which are ordinarily practically free from the disease. Weather conditions during spraying and blooming time were very bad. Some spray injury has been reported. Peach leaf curl is much more serious this year than usual, partially due to the unseasonable weather at the time of the dormant spray. A few warm days in April brought out the foliage before all growers had completed their dormant peach spray.

In general, the growers are doing a fairly thorough job of spraying or dusting.

Indications are that the season will be about a week ahead of last year, and early apples will be ripening by the first or middle of August. The early apples, mostly Red Astrachan, Starr and Williams, have set fairly well, although these varieties represent only a very small proportion of the total crop. Gravensteins are light but Wealthys have set very well. The general feeling among apple growers is that they are faced with another adverse season. Last year the crop was large with rather low prices and this year the crop is short and is being injured by curculio and apple scab.

Peaches are setting fairly well, although the prevalence of the oriental peach moth is causing considerable worry and the growers are uncertain as to the outcome of their crop.—*S. P. Hollister.*

Florida

June 12.—The outlook for citrus has changed but little during the past month. There has been some late bloom but in general not enough to materially change the prospects for the crop, and present indications are for a production considerably under that of the past season. The heavy crop of the past season, together with prolonged drought during the period of bloom, are probably responsible for the comparatively light bloom and set of fruit. Satsumas continue to promise a good crop, with prospects of carlots from sections which have not previously shipped except in small lots.

Hayden mangoes are now being shipped from Dade county. The avocado crop is unusually heavy, although the crop has suffered some injury from dry weather.

Provisions of the Mediterranean fruit fly quarantine are being rigidly enforced and a host-free period is now being maintained throughout the protective zones during which no host fruits or vegetables can be produced or maintained as a possible source of further infestation. There is little doubt that the enforcement of this act during the coming shipping season will cause a material reduction in citrus shipments from the State.—H. A. *Marks.*

Georgia

June 14.—The peach crop is not packing out as estimated. In some orchards the fruit did not size up, even with a moderate crop on the trees, while in others heavy grading is necessary on account of bacterial spot, curculio, and ill-shaped fruit. Estimates are now placing the Georgia peach crop at around 7500 cars, the shortest crop since 1922. To date 750 cars have moved. All of the early varieties have been shipped with fairly good prices for the quality. Hileys are just beginning to move, and the quality is expected to improve with the shipments of the mid-season and late varieties. A heavy infection of bacterial spot developed in some Elberta orchards, but the dry weather during the past week has apparently prevented its further development. The first adult curculio of the first 1929 generation emerged from the soil on May 27. Second brood larvae are expected to show up by June 15-20, but we expect the Hileys to be out of the way before there is much oviposition for second generation "worms." The peach season will be over at Fort Valley by July 15.

Blackberries have been plentiful, and are retailing at from six to 10 cents a quart. The quality is generally good, although many are small. The plum crop has been light, with generally poor quality.—*Oliver I. Snapp.*

Illinois

June 1.—Reports show spotted and below average condition for apples but the peach prospect is the best in years. The apple condition is 60 per cent compared with 58 per cent a year ago and a 10-year average of 63 per cent. The condition of peaches is 77 per cent, compared with 38 per cent a year ago and an average of 45 per cent. The pear condition is 62 per cent, or slightly above the average.—*Illinois Crop Reporter.*

Iowa

June 14.—The apple crop is disappointing to most growers. A very light set of fruit is the general rule in nearly all parts of the State. A tremendous crop of blossoms promised a full crop, but cool, wet and backward weather interferred seriously with normal flower development and more seriously with insect visitation, which is doubtless the real factor causing the heavy drop.

Some orchardists report a fair crop in sight, but more reports indicate a very light crop. Scab is bad in many orchards due to the damp weather and the long interval between the cluster bud and calyx sprays.

Cherries are beginning to turn red, but there is a light crop. Plums are also very light. Strawberries are a heavy crop, and the first pickings have been of good quality.—*H. L. Lantz.*

Kansas

June 15.—In general, the promise of the early spring for a good crop of fruit is sustained. Apples experienced a rather poor week of weather for pollination but have set a fair crop in a number of varieties. Winesap, the leading variety of the State, promises especially well. Other varieties which in the main have a good set of fruit are Jonathan, Ben Davis and Black Twig. In the Arkansas River Valley, Grimes, which gave the highest yields in 1928, are set to have rather a low yield this year.

Sour cherries have been harvested and gave good yields where the orchards had been sprayed sufficiently during the preceding year to keep the leaves on.

Men who buy *millions of tires*
buy **FISK**

LEADING motor car manufacturers, buying tires for the cars they build, will purchase more than 5,000,000 Fisk Tires during 1929. This is a remarkable endorsement of the Fisk *All-Cord* process—convincing proof of Fisk's excess *mileage.*

Fisk's *All-Cord* carcass, made of sinewy cords completely cushioned in live rubber, is the chief reason for Fisk *mileage.* No cross-strings hinder the easy flexing of the *All-Cord* fabric. The tough cords, perfectly parallel, cannot rub or wear—cannot create destructive internal friction.

Then, to give non-skid traction on rough country roads, Fisk uses a special tread that grips securely in any kind of going. Carefully balanced sidewalls, and a multiple cable bead, add extra strength to withstand every strain.

Next time you buy a tire remember that every Fisk feature has the approval of automotive experts—that Fisk Tires are scientifically designed to give the highest *mileage* on your car or truck.

FISK

Grapes at this time promise one of the largest crops of recent years. Peaches made a good set of fruit but the yield is going to be greatly decreased by the prevalence of peach leaf curl in unsprayed orchards and bacterial leaf spot in nearly all except the best cared for plantings.

Insect pests have been kept exceptionally well under control, as the weather has not been favorable for them. In contrast, fungous pests, such as those mentioned for the peach and scab of the apple, are more prevalent than usual. Wet weather has interfered somewhat with the application of the spray schedule, but growers are now making up for lost time.

Except for the cherries, which brought from five to eight cents per pound, no prices of fruit have been set.—*R. J. Barnett.*

Maine

June 13.—Weather conditions up to the present have been rather favorable for the control of apple scab and practically no infections have been noted in well sprayed orchards. Red mite is prevalent in some orchards for the second season but has been well controlled where oil was applied at the proper time. Too early applications of oil and extra large trees that have been difficult to cover thoroughly are reasons for poor control. Leaf hoppers and aphids are present in almost all orchards but are not numerous as yet. A heavy infestation of skeletonizer is probable and the counts of apple maggot in traps point to a heavy infestation later. In general, it appears to be an insect rather than a disease year.

Provided McIntosh is set as heavily as the bloom indicates, thinning will be especially valuable this year.—*A. K. Gardner.*

Maryland

June 19.—We have had a rather heavy drop of some varieties of apples, and Stayman, Twig and Delicious are running about 20 to 25 per cent. Scab has been serious in some parts of the Eastern Shore, especially around Berlin, and also in Frederick county. Very little codling moth injury, but egg laying is on now during the hot spell.

Peaches escaped curculio pretty well and look good, but Bacterium pruni is showing up rather badly in some sections. Peach moth is doing some damage. Some bad hail injury near Smithsburg, Washington county.

All fruits show good size.—*A. F. Vierheller.*

Michigan

June 11.—The prospects for fruit crops are about normal. Some sections have been hurt more severely than others. For instance, sour cherry yields will be light in the Grand Rapids and southwestern Michigan territory but in the northern part of the State, between Ludington and Traverse City, where the bulk of our cherry trees are located, a good crop is in prospect.

Apple scab has been unusually severe this year and with a long delayed blossoming season has taken a heavy toll in orchards that were not thoroughly sprayed at least two or three times from both sides previous to blossoming. There are some orchards in which scab is showing on the foliage, but not much infection of the fruit has occurred and in these cases we believe that it will require very careful and thorough spraying to keep the fruit clean.

Quite a number of growers experienced some damage from frost this year in locations that are generally considered first class. I think this was due partly to the fact that growth started very early and then considerable cold weather occurred at blossoming time. The Delicious particularly has not set well. Spys in most orchards are not setting very heavy but I predict that we will have a good crop. Baldwins in sprayed orchards are very good and this is also the case with Wealthys and Jonathans. We have a rather spotted condition in regard to McIntosh. Some orchards have splendid sets while others are rather light.—*H. D. Hootman.*

Mississippi

June 5.—Our peaches are beginning to ripen. They are a little under size due to bad weather conditions. We have had a very poor stand of pears because of excess of rain during blooming season. Pollination has been very poor.—*J. C. C. Price.*

Missouri

June 10.—Apple prospects are still from fair to good. Local hailstorms have done some damage in isolated spots. The June drop has been fairly heavy, perhaps greater than in most years. This is believed to be due to bad pollination weather at blooming time which tended to prevent satisfactory pollination.

Other fruit, including pears, peaches, cherries, plums and grapes, indicate a good crop. Weather conditions have generally been favorable, although rains have been very prevalent and cultivation has been delayed. Moreover, some foliage injury has occurred due to cold winds and cold weather.

Spray burn injury to both fruit and foliage, due to lime-sulphur and Bordeaux spray, has been rather common and perhaps more serious than usual. Apple scab is more prevalent this year than usual, and where orchards have not been sprayed, it is believed that apple blotch will be unusually serious. Codling moth has been delayed, and but few worms have entered the fruit.—*T. J. Talbert.*

Montana

June 17.—I have had one report from the Bitter Root Valley which indicates that the set of fruit is somewhat lighter than anticipated. The June drop is still ahead. So far as I know there is no serious outbreak in the way of insects or diseases that will have a bearing on the crop.—*F. M. Harrington.*

New Hampshire

June 12.—Too heavy bloom and the effects of the cold weather mentioned in a previous report appear to have caused McIntosh to set rather lightly. The set in suitably cross-pollinated orchards is much better than in those blocks planted solidly to one variety. Growers were handicapped by wind and rain in applying the important preblossom sprays for scab.

Although it is still early to observe lesions, it seems that some infection from scab must have occurred, and continued thorough spraying will be necessary to bring through a high quality crop.

Baldwins bloomed lightly but set very heavily even on spurs on which part of the flowers had been killed by cold.—*George F. Potter.*

New Jersey

June 18.—There has been very little change in the fruit prospects during the past month. Apple scab is still prevalent in quite a number of orchards, although its development has been checked by effective spraying and dry weather. Stayman has a rather light set of fruit in all sections, and the same is true of Paragon and Winesap. Delicious has a very light set in southern New Jersey but is better in the central and northern sections. First brood codling moth side worms and curculio have caused considerable injury to apples in many orchards, although in general the fruit is in better condition than usual, with the possible exception of an increased amount of scab. Considering the entire State, I do not believe we will have over 35 per cent of a normal crop of winter apples and between 50 and 60 per cent of a normal crop of summer apples. There is every indication for a heavy crop of peaches, although a light set of Elberta is reported from some sections in the northern part of the State.—*Arthur J. Farley.*

New York

June 18.—In the Hudson Valley cherries will apparently not be over 50 per cent of a crop. Most of the commercial growers are dusting and spraying thoroughly for the control of rot and cherry maggot. Probably the first picking of cherries will not occur much before July 1 and will continue throughout July. Quite a percentage of sour cherries have been contracted for by the cold process men at the rate of six cents per pound.

The peach set in the Hudson Valley is good and the crop will apparently be fully as large as last year.

There has been a very heavy blossom of pears, but the set of fruit has been disappointing and apparently the crop will be light.

Apples showed a heavy bloom. Conditions for pollination were poor. Weather favorable to apple scab has been plentiful and there is considerable infection of apple scab even on well sprayed and dusted orchards. In some sections of the Hudson Valley serious injury to apples resulted from freezing weather in early April and due to unfavorable weather for pollination. Many growers are reporting a very light set of most varieties. This appears to be particularly so of McIntosh and Rhode Island Greening. The apple crop in the Hudson Valley promises to be considerably lighter than in 1928.—*B. D. Van Buren.*

North Dakota

June 19.—Late frosts did considerable damage to some varieties of plums and apples but the prospects are still favorable for a good crop of both. Some spraying was done for the tent caterpillar. The aphis is our worst pest and since it has been cold and dry they have been unusually bad this spring.

The currant and gooseberry crop appears to be very good and raspberries are looking fine. There is not much sign of red spider, which damaged the crop so badly a year ago.

There are a few everbearing strawberries in home gardens that are ripening, but most of the fruit will not ripen for a week or 10 days yet. The crop looks good but the berries will probably be small on account of the drought. There have been no berries sold locally. —*Oliver Strand.*

Ohio

June 12.—The outstanding features of the fruit situation as they have developed during the past couple of weeks are, first, the very serious development of scab fungus on both fruit and foliage in several parts of the State. Dust has been reported as conspicuously less effective this season than sprays. A second feature is the serious drop of fruit which has occurred practically all over the State. Even trees of Rome Beauty, which promised a full crop, have dropped their fruit very seriously during the past week. A heavy drop has also occurred in eastern Ohio and to a somewhat less extent in the vicinity of Wooster. Many trees have been seen where an early freeze caused injury and blackening of the spur leaves. This peculiar development has been incorrectly credited to both spray injury and scab. It is useless to make any attempt at an estimate of the fruit crop at present time.—*J. H. Gourley.*

Oregon

June 17.—The apple crop will be light this year, probably not over 60 per cent of last year's crop of 6480 carloads.

The Rogue River district reports a pear crop slightly smaller than last year, while in Hood River, Bartlett pears promise about 50 per cent of last year's crop. All told, the pear crop may approximate 2,500,000 bushels. A few contracts have been made for canning pears at $65 per ton, but growers are not selling freely at that price.

The cherry crop is very spotted and apparently about the same as last year in western Oregon. In eastern Oregon a few districts report a slight increase over last year. Apparently, the state as a whole will have more cherries than last year's production of 10,875 tons. Prunes are rather spotted, some districts carrying a heavy crop while others have only a small crop. Some forecasts give as high as 50 or 60 million pounds of dried prunes for western Oregon and Clark county, Washington, combined. In the fresh prune shipping districts in the eastern part of the State, the crop will be a little less than last year, when some 20,000 tons were produced.

Due to the very late season, strawberries are now being harvested. Rainy weather is hurting the quality of the berries and causing some loss. It is estimated that the production will be about the same as that of last year, which was 15,000 tons. Strawberries are selling from four to seven cents per pound, depending upon the variety.

The raspberry crop will be less than last year as there was considerable winter damage in some localities. Some contracts are reported at eight cents per pound.

The Loganberry crop will not exceed 50 or 60 per cent of last year. There has been some winter damage to canes and some acreage has been pulled.—*W. S. Brown.*

Rhode Island

June 19.—A very slight set of fruit should not be taken as an excuse for less spraying. A smaller quantity of fruit should increase the value of it, and good cultural methods should be strictly adhered to.

The curculio has been particularly bad this year and the thorough spraying in between the usual 10-day and apple maggot sprays should help to control.—*E. P. Christopher.*

Utah

June 1.—Estimated fruit crops for 1929 just issued by Frank Andrews, Federal agricultural statistician of Salt Lake City, indicate that the production will be slightly below average as far as apples, peaches, pears and cherries are concerned.

Peaches are estimated at 592,000 bushels as compared with 612,000 bushels in 1928 and a five-year average of 553,000. The condition of the crop is estimated at 75 per cent as compared with 88 per cent last year and a five-year average of 73 per cent.

Cherries are forecast at 4000 tons, compared with 4600 tons last year and for the average. Their condition is placed at 73 per cent of normal.

Apples are given as 75 per cent of normal as compared with 86 per cent for last year and for the average. No production estimate is given.

Pears are estimated at 80,000 bushels this year as compared with 87,000 last year and 60,000 for the five-year average. Crop condition was placed at 80 this year and 78 for the same date last year. Average condition on this date for five years has been 81 per cent.—*F. M. Coe.*

Vermont

June 8.—The apple outlook at present is very good. Preliminary reports of growers in different parts of the State indicate that there has been a good set of most of the leading varieties.

It is a most fortunate circumstance that the hot weather of late May came just as the trees were about to come into full bloom. The warm weather made conditions very favorable for the flight of bees and the high temperatures brought about a most abundant secretion of nectar and high production of pollen, the two essentials to induce the bees to keep on the wing and visit all of the blossoms. Beekeepers state that there has been good production of apple blossom honey, considerably more than usual.

With respect to the different varieties, it has been reported thus far that there was a most magnificent bloom of McIntosh, which is the leading variety in the State. Some growers reported that there never was such an abundant set of blossoms of McIntosh Red as appeared this year. One extensive grower reports 100% for McIntosh. Some other varieties blossomed less profusely. The Northern Spy gave fair bloom; Rhode Island Greening, rather light; Tolman Sweet, very good; Wealthy, fair; Delicious, heavy to extra heavy.

The weather for orchard work has been good for the most part this year. The cool weather of early May deferred the blossoming until after the danger period, and although the temperature was low, it was not particularly bad for the fruit grower. There was enough good weather interspersed with the poor to enable the spraying work to be done on fair days. The hot weather of late May was ideal for fruit trees.

The set of cherries of both sweet and sour varieties is excellent. There are no reports on plums, or strawberries, although the plants withstood the winter very well.

Taking all of the conditions into account and accepting the preliminary report of the fruit set, it would seem, that the fruit growers were heading up for another very successful season.—*M. B. Cummings.*

Washington

June 18.—The fruit crop is very spotted. There has been no unusual amount of insect or disease trouble and the spraying and other orchard operations are being well done and are up-to-date. Prospects are good for high quality and good size in all fruit.

The apple crop is the most spotted and irregular of any in the last 10 years. The Winesap is probably the most evenly set of any variety.

The pear crop is light but in good condition. Reports indicate that Bartletts may go as high as $75 per ton. Other varieties are of secondary importance.

Peaches are light but growing well. In order to place on the market high quality fruit, picking and grading will be more carefully done this year than ever before. No prices have been named.

Cherry harvest will generally begin in the lower valleys in late June. About 50 to 60 per cent of a crop is in prospect. Prices are prospectively good but have not been set at this date.

Plums, prunes and small fruits are very irregular, as winter injury and pollination troubles are developing and two more weeks of growing weather are necessary to determine the condition of the crops.

Many men in the co-operative association fear that the Farm Aid bill recently passed by Congress will hinder more than help their work.—*O. M. Morris.*

Some Problems of Peach Marketing

(From Page Nine)

can be indifferent to the subject of keeping production within due bounds without being a contributing factor to overproduction.

Variety Preferences

Georgia probably ships more varieties than all other states combined. The chief reason for this is that it furnishes most of the early peaches, and growers have generally found that some diversification of varieties produced in Georgia would seem to indicate that diversification is overdone at least in this state: Arp, Mayflower, Belle of Georgia, Carman, Dixie Queen, Early Elberta, Elberta (late), Greensboro, Hiley, Lovell, Red Bird, St. John, Old Mixon, and Uneeda. Uneedas, Hileys and Elbertas constitute more than 80 per cent of the total Georgia production, and it is believed that the elimination of some of the less important varieties would probably be beneficial.

Not taking into account the cling varieties grown in California, most of which tonnage goes to canners, it is believed that the Elberta variety constitutes fully 80 per cent of the total late peach production. It is an old favorite that does not seem to lose any of its popularity with the passing years. The Hale, similar in flavor and general appearance, is well received by the trade in many of the important markets. It commands a premium of from 25 to 50 cents per bushel over all other varieties. This statement should not be construed as a recommendation to displace other varieties with the Hale, but the subject merits considerable thought.

Containers, Grading and Packing

While there are at least 12 different types of containers used in shipping peaches, the trade generally regards the following as standard containers: The six-basket crate, round bushel basket, round half bushel basket, and the western or California style box. Each section has its own preference as to containers, but the point to be borne in mind is that preferences should be governed by the trade's demands rather than by influences brought to bear by other agencies, which sometimes have selfish motives in trying to foist irregular containers upon the shipper. Fruit and vegetables shipped in packages that are little known in the trade, or are unsightly from being weatherbeaten or soiled, usually sell at a substantial discount. These containers may have been bought at what seemed a low price, but their use usually proves to be false economy.

The promulgation of standard peach grades by the United States Bureau of Agricultural Economics is particularly valuable to peach shippers, chiefly because it affords a definite basis on which to buy, sell and adjust claims. It also enables the shipper to improve his grade and pack and to communicate with the trade in common trade terms. Previously this was not possible, because each individual had his own ideas as to what should constitute a particular grade. There was nothing definite, and naturally this led to endless quibbling and misunderstanding.

In important peach producing sections, where there is sufficient demand, the federal government, either alone or in cooperation with the state, conducts an inspection service and issues certificates that set forth the quality and condition of the fruit inspected. The educational value alone of this service to the grower cannot be overestimated, as he is thereby taught to avoid the objectionable features that contribute to a poor grade and pack. This may be readily understood when it is realized that this work is in charge of a corps of well trained inspectors and supervisors, who actually inspect the fruit as it is being packed and work constantly with the shipper with a view to aiding him in putting up a good grade and pack.

Reducing Loss

The grim reaper "Decay" takes a tremendous toll each season, although reliable figures as to totals are lacking. Brown rot is probably the most common of all peach decays, and while it is commonly referred to as an orchard disease, it occurs also in transit and in the market. All that is necessary to start brown rot is the presence of these spores, together with conditions advantageous to them, such as high temperature with moisture, over-ripeness, bruising, etc.

By applying inversely the same law of cause and effect, we arrive at the preventive, or at least we know how the loss may be materially reduced. Cleaning of cars, proper refrigeration, and the exercise of due care in picking and packing are all important factors in holding down loss from decay, whether it be brown rot or some other form of decay.

Owing to the highly perishable nature of this fruit it demands more careful handling than some of the other fruits, although this does not mean that carelessness should be permitted under any circumstances. Proper loading is very important, as any railroad freight claim agent will readily agree. Loss from breakage, which is generally caused by shifting of the load, or too heavy loading, is perhaps second in importance to that from decay. The United States Department of Agriculture, Washington, D. C., publishes bulletins on the best methods of loading certain fruits and vegetables, which can be obtained at a very small cost. A list of these publications may be obtained on request to the department.

Studying the Market

There was a time when the grower was concerned chiefly in "making two blades of grass grow where but one grew before," or in "making two streams of milk flow where but one had flowed before," to use a homely simile, but that time has passed. The problem of marketing has become more and more complex, and the grower or dealer who has failed to keep pace with the times is sadly out of tune.

However, notwithstanding the many new marketing problems that have presented themselves from time to time, it should be gratifying to know that governmental, state and even private agencies are performing a real service by keeping the trade posted on market conditions. Federal, or Federal-State, market news offices are maintained in most of the large terminal markets during the entire year, and in the principal shipping sections during the main crop movement. Daily market reports showing shipments, prices, supplies in the terminal markets, general market conditions, and a great deal of other valuable information, are printed and sent free upon application. Much of this material is broadcast by radio and carried in the columns of various newspapers and farm publications.

Under existing marketing conditions, it is absolutely essential that the shipper be posted on the market, and with the great amount of information available, there is no excuse for haphazard marketing. The really successful growers and shippers avail themselves of all possible market information and make a close study of the various market reports. Knowledge of the up-to-the-day conditions in the various markets, the number of cars being shipped each day, condition of offerings, competitive crops movement, conditions in producing sections, etc., if turned to proper account, will often mean the difference between profit and loss.

The Grimes Golden Apple

ABOUT 1790, Edward Cranford planted a whole orchard from apple seeds in what is now Brook county, West Virgina. When the orchard was about ready to bear, he sold his farm to Thomas P. Grimes. One of the seedling apple trees produced a fruit of such a rich golden color and fine quality that the name of Grimes soon became famous. As early as 1804 Thomas Grimes sold fruit from this tree to the traders in the New Orleans market. About 1899 the parent tree fell to the ground, and, as far as is known, there is nothing left of it except a gavel made from its wood and presented to the West Virginia State Horticultural Society. The picture on page 18 shows the original Grimes Golden apple tree, from which all the scions were subsequently taken to be grafted on other stocks.

She Heard Some one going Up the Stairs

A Bell System Advertisement

THE family of a farmer in Missouri had gone to town for a Fourth of July celebration. A daughter in another town came home unexpectedly. Entering the house, she heard some one going up the stairs. She called out. It was a burglar. Frightened, he escaped through a window. She telephoned to a neighbor who immediately called the Sheriff. The burglar was caught the next day.

* * *

A farmer near Medford, N. J., was offered 10c a pound for a carload of steers by a Philadelphia slaughterer. The farmer wanted 10¾c. He telephoned a Jersey City commission man and described the cattle. He was advised they ought to bring 11c. He shipped the cattle that day and they sold for 11¼c a pound. Profit by telephone, $262.50.

* * *

The telephone often saves lives and property in case of burglary, fire, injury or sickness. It pays for itself many times over by running needed errands to town, bringing a spare part when some machine is broken, or in finding where and when to sell for the best price.

The modern farm home has a telephone.

If your subscription is about to expire (see date on address label) send your renewal now, so as not to miss any copies. Keep your file complete.

There is no other fungicide equal in effectiveness to Bordeaux

The reaction of Copper Sulphate (Bluestone) solution, and lime water, when carefully made, and used fresh, forms a bulky, adhesive and relatively insoluble precipitate, which is the most effective fungicide known.

C. S. Crandell, Illinois Experiment Station, advises that early application as a preventative is much to be preferred to later application after ravages have begun.

The strength of Bordeaux being extremely important, care should be exercised to use Copper Sulphate of known purity.

Nichols Triangle Brand Copper Sulphate

99% Pure

The standard of quality and purity. Packed in new clean barrels and kegs

Nichols Copper Co.

25 Broad Street **New York**

Instant Bordeaux, a Better Copper Spray

(*From Page Five*)

Steps in the Preparation of Instant Bordeaux

1. To prepare a 200-gallon tank of 2-4-50 Bordeaux, weigh out eight pounds of powdered bluestone and 16 pounds of chemical hydrated lime.

2. Fill the tank one-fourth full of water and start the agitator, being sure that it works properly.

3. Add powdered bluestone by pouring it onto the tank screen and washing it into the tank with the inflowing water, as shown in Figure 3.

4. Add water until the tank is three-fourths full, the agitator still running. By this time the bluestone will be dissolved.

5. Next add the chemical hydrated lime either as a paste or in dry form by pouring it on the screen and washing it into the tank, as in the case of the bluestone.

6. Now fill the tank and permit the agitator to run a minute longer, after which lead arsenate is added if needed in the particular spray application.

Excellent Bordeaux can be prepared in this manner in the time usually required to fill the tank with water. The advantages of this method are apparent to anyone who has ever prepared Bordeaux. The cost of the chemical hydrate is higher than quick lime but the incidental time and labor necessary to slake and strain the lime is probably equal in cost to the higher price of the chemical hydrate. The most important error factor in the old method of making Bordeaux, namely, the selection, slaking, straining and handling of quick lime, is eliminated and a remarkably uniform product is substituted for it. Actual time records indicate that a 300-gallon tank load of Bordeaux can be prepared in four minutes.

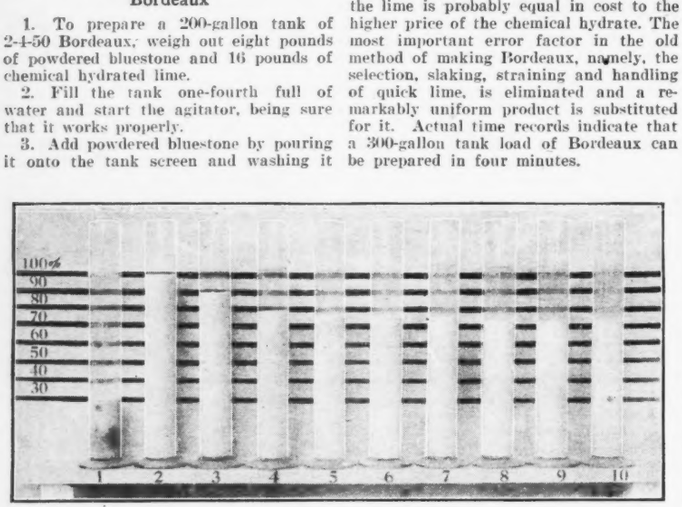


Figure 4. A suspension test with 10 different formulas of "instant Bordeaux." Number 2 is a 1-1-50 Bordeaux with a suspension of 98 per cent after standing one hour. Number 1 is 1-1½-50 Bordeaux, which indicates chemical breakdown and low suspension within 30 minutes. High suspension is desirable in good Bordeaux mixture.

The Physical Characteristics of Good Bordeaux

Good Bordeaux mixture should be of a very fine texture, flocculent, gelatinous in appearance with a high suspension ratio and it should not deteriorate chemically in too short a time. A Bordeaux of the extremely fine and gelatinous type spreads better and adheres longer than the coarser and nongelatinous type. By the suspension ratio we mean simply the ratio between the blue material in the tank—the actual Bordeaux—and the total amount of water in which it is suspended. In other words, a Bordeaux with a high suspension after one hour is one which settles out comparatively slowly.

Other things being equal, high suspension is probably the best criterion to judge the value of Bordeaux. Improperly prepared Bordeaux settles out rapidly and breaks down chemically in half an hour or even less. High suspension or slow settling out indicates further that chemical reaction is complete and that the proper proportions of lime and bluestone have been brought together.

The reader can get an idea of what we mean by suspension by examining Figure 4 which is a picture of an actual test made by the writer. During the period of this study, the writer made more than a thousand suspension tests with 30 different formulas of Bordeaux, ranging from 1-½-50 at half pound stages for the lime up to 3-5-50. Thus, one series of these tests would include triplicate determinations of 2-½-50, 2-1-50, 2-1½-50, 2-2-50, 2-2½-50, 2-3-50, 2-3½-50, 2-4-50, 2-4½-50 and 2-5-50 Bordeaux.

It is apparent that it would be impossible to record in an article of this nature even a small portion of the data resulting from these suspension tests, all of which will appear shortly in a technical bulletin from the Virginia Experiment Station. It should be mentioned here that a series of tests comparing the suspension values of the old type of Bordeaux with that prepared according to the new method indicate that the suspension ratio of the new type is higher than the old. At the end of an hour, for instance, the suspension percentage of the old type of Bordeaux was 80.6 while the new type was 94.1 per cent.

To give the readers of the AMERICAN FRUIT GROWER MAGAZINE an idea of how slowly Bordeaux prepared according to the new method settles out, we shall cite some figures. At the end of one hour the average suspension percentage of 1-1-50 Bordeaux was 98.3, after two hours it was 96.8 and after three hours it was 93.6 per cent. For the 2-3½-50 Bordeaux, the percentages for the one, two and three-hour periods were 98.9, 97.6 and 95.2 per cent, respectively. We found that the addition of such materials as lead arsenate, calcium arsenate, calcium caseinate, oil emulsions and other materials used in combination with Bordeaux, materially reduced the suspension and caused the Bordeaux to settle out much more rapidly.

Facts About the Chemistry of Bordeaux

By varying the proportion of bluestone and lime in the different formulas of Bordeaux, slightly different end products result. The main compounds in Bordeaux are basic sulphates which undergo chemical changes when exposed to the action of the carbon dioxide of the air and meteoric moisture. The proportion of lime to copper sulphate has varied very greatly since the early development of Bordeaux, but today the tendency is toward an excess of the lime. Even in a Bordeaux of the 4-4-50 formula there is a considerable excess of lime above that required to completely precipitate the copper. There is probably no advantage in using an excess of lime as a prevention of scorching; on the other hand, there is evidence to indicate that an excess is a disadvantage, according to reports of research made in England. An excess of lime delays the liberation of soluble copper from the Bordeaux, since the toxic element in Bordeaux is copper. At times and under certain conditions, lime causes scorching. The very element which causes Bordeaux to be a fungicide of high toxicity also causes the spray injury. The cause of spray injury in Bordeaux is copper entering either the stomata of the leaves or at the base of the fine hairs on young fruits and leaves. Copper injury is very capricious in its appearance, but wet, cool weather seems to be the predisposing factor.

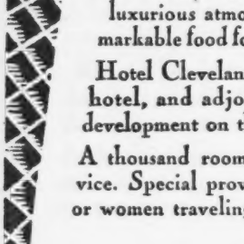
It is believed that a short period of time elapses before Bordeaux becomes toxic to fungi. This is thought to be due to an excess of lime and a non-availability of copper. When Bordeaux is applied to an apple it dries up and basic sulphates are formed which separate from the lime. When carbon dioxide reacts with the former there is no lime near enough to decompose some of the copper sulphate liberated and this compound being soluble in water is the source of the toxic copper.

It has been demonstrated that copper is actually absorbed by the leaves, and some of the earlier investigators thought this to be the basis of toxicity of Bordeaux, an assumption now known to be erroneous. There seems to be no relation between excretions by leaves and fruit and soluble copper on them. Meteoric water seems to be the dissolving agency and not plant excretions. The basic sulphates formed from Bordeaux are at first insoluble but the action of the air, especially the carbon dioxide in it, reacts with them and makes them soluble.

The efficiency of Bordeaux is not due to the amount of copper used so much as the amount of soluble copper available. The visible deposit of Bordeaux on leaves and fruit is no index of its toxicity, since four-fifths of this deposit is chalk. The use of the minimum amount of lime consistent with completely throwing down the copper results in a Bordeaux with greatest fungicidal value because of the availability of soluble copper. However, this type of Bordeaux, by virtue of the large amount of soluble copper quickly available also has a greater tendency to cause spray burning.

Suspension of Bordeaux is decreased by an increase of temperature. When Bordeaux disintegrates chemically it is known that sphaerocrystals are formed and the formation of these crystals is

Figure 5. An up-to-date 300-gallon spray outfit. The daily capacity of such an outfit is approximately 4000 gallons per day. It is evident that to delay such an outfit on account of clogged spray nozzles resulting from coarse and gritty Bordeaux mixture costs money.



Clevelanders
prefer the
CLEVELAND

THEY, who know it best, prefer Hotel Cleveland for its warm friendly hospitality, its luxurious atmosphere of a private club, its remarkable food for which it is nationally famous.

Hotel Cleveland is Cleveland's most modern hotel, and adjoins the vast new Terminal development on the Public Square.

A thousand rooms, many at $3. Garage service. Special provisions and care for children or women traveling alone.

HOTEL
CLEVELAND

Index to Advertisements

The concerns whose advertisements appear listed below are equipped to give prompt and satisfactory service to the American fruit grower. Most of them issue literature that is freely at the disposal of our subscribers. It is to the advantage of all that when writing to an advertiser you use the address exactly as it appears in the advertisement, and that you state in your letter: "I read Your Advertisement in AMERICAN FRUIT GROWER MAGAZINE."

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New Non-Stop Tractor Record in Orchard Work

A NEW world's non-stop tractor farming record at drawbar work was made by the Battaglia brothers, "Joe" and "Bill," of California. Dean C. L. Cory of the College of Mechanics, University of California, sealed the gas tanks and attached two recording clocks on a caterpillar type tractor drawing a double disk harrow, and the brothers were told to go ahead with their spring orchard disking without stopping the tractor engine for 240 hours if they wanted a new official world's non-stop tractor farming record.

The two brothers decided to take the run in 12-hour shifts, changing seats at noon and midnight daily. Thus they got their sleep and meals as usual and went along with their spring orchard work much as thousands of other farmers who run their tractors night and day at peak seasons. Only they were under observation and had to come up to the gas and oil station to have the tank unsealed whenever they needed gas.

When Dean Cory unsealed the gas tanks and stopped the non-stop record of exactly 10 days and nights, a new official world's non-stop tractor farming record at drawbar work was made.

Various "records" made by farm tractor owners in New Zealand, Australia and the United States have been reported from time to time in recent years. None of these were officially handled by non-interested engineers representing technical societies or colleges of engineering. Hence, when the Battaglia boys began looking for new worlds to conquer, members of the American Society of Agricultural Engineers, the Society of Automotive Engineers and the American Society of Mechanical Engineers got together and drew up rules for the test that would make it official and at the same time mean something worth while to the orchardist. (Picture on page 18.)—*C. W. Geiger, California.*

correlated with lack of adhesive properties. In general, the keeping qualities of Bordeaux depend upon the concentration, the temperature, ratio of copper to lime and the presence of foreign matter.

Is the New Type of Bordeaux Toxic?

The fungicidal effectiveness of Bordeaux prepared from powdered materials has been tested for two years in an orchard of Northwestern Greenings heavily cankered by the fungus causing Missouri apple blotch (Phyllosticta solitaria). In 1925 the unsprayed trees (checks) developed 65.8 per cent of blotchy apples while the trees sprayed with a 2-4-50 Bordeaux in the three, five and seven weeks' sprays developed only 4.1 per cent of blotch. In 1926 the same trees were sprayed with the same strength of Bordeaux and in this year a much heavier infection occurred in the checks. The infection in the checks was 97.9 per cent, while the trees sprayed three times as in 1925 developed only 4.6 per cent of blotch.

The writer is perfectly aware of the fact that certain experiment station and extension specialists in plant pathology are committed to the use of the old-fashioned method of preparing Bordeaux. Force of habit is so strong in certain individuals that neither scientific data nor recent experience will budge them one iota. If these individuals insist on the use of quick lime instead of chemical hydrate, the writer would like to suggest the use of the new form of this type of lime, namely, the powdered quick lime. This lime has been screened through a 100 mesh sieve and is the result of grinding a specially selected stone lime.

The advantage of this type of quick lime is that it is practically impossible to "drown" it with amounts of water frequently used in the slaking process. There is very little residue or gritty material left after the slaking of this type of quick lime. We have used it with very good results. It costs about as much per pound as chemical hydrate but the extra work of providing containers in which to slake it, together with the necessity of slaking it, makes it slightly less desirable than the chemical hydrate. However, it is more fool-proof than the regular stone lime and it does not require straining after it is slaked. To recommend this type of quick lime instead of the stone line would be an act of charity to many of our fruit growers who have come to bat and struck out so many times in the game of preparing Bordeaux.

In conclusion, let it be said that the proof of the pudding is in the eating. The writer does not claim everything for "instant Bordeaux." Any type of Bordeaux applied under the wrong weather conditions will cause spray burning. One thing is certain and that is that with the use of the powdered materials described in this article the spray gun will not be a shotgun as it has been known to function when spraying coarse particles resulting from a failure to strain slaked quick lime. Bordeaux resulting from this new process of mixing has all of the earmarks of good Bordeaux.

The thing that will appeal to the practical grower is the ease of making Bordeaux according to the new method. This method certainly removes most of the stumbling blocks of the old method. There is no wizardry connected with the new method but a good deal of common sense and fool-proof procedure resulting from the observation of hundreds of apple growers making Bordeaux according to the ancient and honorable method. This new method is being adopted very rapidly in Virginia and West Virginia and its simplicity and effectiveness is such that the writer recommends it with confidence as a very promising method of making Bordeaux mixture by the fruit growers of the United States.

Suggestions for Apple Growers

CERTAIN suggestions to apple growers, the general observance of which he believes essential to the well-being of the apple industry, were recently made in a radio address by Dr. William A. Taylor, chief of the United States Bureau of Plant Industry. These suggestions were:

"Stabilize annual production and improve average quality by better culture, pruning and pest control.

"Eliminate from commercial orchards as rapidly as practicable varieties of inferior quality and unattractive appearance.

"Refrain from planting additional acreage, except of most desirable varieties on sure-crop sites where production costs are low or market quality unusually high.

"Grade rigidly, handle carefully, pack tight, store promptly, sell effectively.

"For the small-scale grower in the more important producing districts, this last item may sound like co-operation. That is, in fact, what is indicated in many sections as the best bet in apple marketing."

Dr. Taylor called attention to developments among these lines in the last 20 years. Comparing present conditions with those of 1910, he said: "There are about a third fewer trees of bearing age now, and there are only about half as many young trees in orchards not of bearing age as there were in 1910."

This has not caused a decline in apple production, he said. It has resulted in more concentrated production in favored localities and on smaller acreage. Many trees have been replaced or top-worked with more desirable varieties. Bearing trees are getting better care and more intelligent attention. The farmer who once had a few trees that were "hardly worth the trouble," and who marketed a few bushels of apples, many worm eaten or poorly developed, is now more likely to have the orchard in some other crop, and may be buying his apples. The apple growers who are maintaining their orchards are getting, as a rule, more fruit and better quality fruit from their trees.

Field Mice Cost Six Million Dollars

(*From Page Six*)

clearing away the sod and other vegetation from around the base of the tree during the late fall and usually with a hoe. The labor required for this operation may be valued at five cents a tree, although it probably should be figured at several times this amount. Add to this the cost of poisoning, which is also practiced by possibly 30 per cent of the commercial orchardists of this region, and which costs approximately one cent a tree and we have a total cost of combatting the mice of approximately $1,500,000.

The total loss to the apple growers of the eastern United States is thus in excess of $6.000,000. It should also be emphasized that this huge loss represents the average year and does not take into consideration the potential damage of which these destructive rodents are capable during so-called "mouse years." For example, if the damage inflicted by the mice in the small State of Connecticut during the winter of 1919-20 had extended in equal severity to the whole of the district included in this estimate, the loss to the fruit industry would have amounted to over $40.000.000 or nearly seven times the normal damage.

While admittedly far from accurate, the above estimate is considered conservative and at least will serve to indicate the importance of the field mouse problem to the apple-growing industry.

No Reimbursements for Trees Destroyed Because of Phony Disease

EFFORTS on the part of Governor Hardman, of Georgia, to have the government pay for peach trees destroyed because of "phony" disease seem destined to meet with failure, due to the fact that the policy of the government is to reimburse growers only for *healthy* trees or stock destroyed in the course of a quarantine.

"I am mindful of the conditions in Georgia," says Senator Georga, in reply to Governor Hardman's request for an investigation, "and it has been my constant purpose to protect the interests of the people of the State.

"But the quarantine against the 'phony' peach disease does not call for the destruction of sound trees, as I understand it. 'Phony' trees have no commercial value. It would, therefore, be impossible to have the owner of diseased trees reimbursed. The government will not pay for any fruit destroyed by any insect. Therefore we could not ask for an appropriation to reimburse the peach growers of Georgia for losses resulting to the peach crop through worms, insects or other disease.

"I trust you will appreciate the distinction which I have tried to point out. "Our growers of fruits and vegetables cannot be reimbursed unless sound fruits and vegetables are necessarily destroyed in order to prevent the spread of destructive disease. And so far as I know, the destruction of sound trees in Georgia is not contemplated by the quarantine and control board."—*J. H. Reed, Georgia.*

Classified Advertisements

ADVERTISING RATES, 15 CENTS A WORD

Write advertisement on separate sheet. Please enclose cash with order. For advertisements addressed in care of this publication, allow 5 words for address.

SPECIAL NOTICE

All advertising copy, discontinuance orders or change of copy must reach this office by the 10th of this month for next issue.

Address
AMERICAN FRUIT GROWER MAGAZINE
53 West Jackson Boulevard, CHICAGO

AGENTS—SALESMEN WANTED

$12.00 DAILY SHOWING NEW LINEN-LIKE tablecloth. Washes like oilcloth. No laundering. Sample free. Bestever, 666 Irving Park Station, Chicago.

WANTED—MAN WHO KNOWS FARM LIFE TO travel in country. Steady work. Good profits. McConnon & Company, Room A-1407, Winona, Minn.

BUSINESS OPPORTUNITIES

DEHYDRATER OPPORTUNITY — SPLENDID location for dehydrater plant for apples, some prunes, for man with capital and experience. For information address Weiser Commercial Club, Weiser, Idaho.

MUSKRAT RAISING IS A PROSPEROUS BUSIness. Get facts. Box 181-B, South Chicago, Ill.

FARMS AND ORCHARDS

ORCHARD—2000 APPLE TREES, CHOICE varieties in bearing. Priced right. Terms. T. W. Campbell, Elgin, Ill.

ORCHARD—3000 APPLE TREES, 160 ACRES, good buildings. Box 553, Windber, Pa.

FARMS WANTED

WANTED—TO HEAR FROM OWNER OF LAND for sale. O. Hawley, Baldwin, Wis.

FUR RABBITS

MAKE BIG MONEY WITH CHINCHILLA Rabbits. Real Money Makers. Write for facts. 846 Conrad's Ranch, Denver, Colorado.

HELP WANTED—INSTRUCTION

WANTED IMMEDIATELY—MEN-WOMEN, 18-55, qualify for permanent government positions, $105-$250 month; experience not required; vacations with full pay; common education; many needed. Write Instruction Bureau, 250, St. Louis, Mo., today.

GOVERNMENT JOBS—$1260 TO $3400 YEAR. Men-women, 18-50. Steady work. Vacation. Common education usually sufficient. 25 coached free. Write for particulars immediately—today. Franklin Institute, Dept. W-73, Rochester, N. Y.

HUNTING DOGS

HUNDRED HOUNDS. CHEAP. TRIAL. CATAlogue. Hundredhound Kennels, C-11, Herrick, Ill.

READY TO SELL MY TRAINED COONHOUND on trial with terms to please the buyer. Paul Davis, B-32, Charleston, Mo.

PACKING FORM

AGENTS AND USERS WANTED TO SELL THE Breckon ring face bushel basket packing form—a self seller, having several leading features. Write for description and price. Wm. A. Breckon, Grand Junction, Mich.

PLANTS

LATHAM RASPBERRY. FREE FROM MOSAIC, crown gall, etc. Fall, spring delivery. A. B. Coleman & Son, Aitkin, Minn.

NORTHERN GROWN CABBAGE PLANTS—Good delivery or money refunded. Best strains Danish seed, chemically treated. Postpaid: 200, 65c; 500, $1.25; 1000, $2.25. Cauliflower: 50, 40c; 200, $1.00. Fort Mellinger, Department AF, North Lima, Ohio.

POULTRY CALENDAR

THE OLD POULTRYMAN'S CALENDAR, MAKES poultry keeping profitable. $1.00. Louis C. Frederick, 7 Y. Shawmut Ave., East Weymouth, Mass.

SONG POEMS WANTED

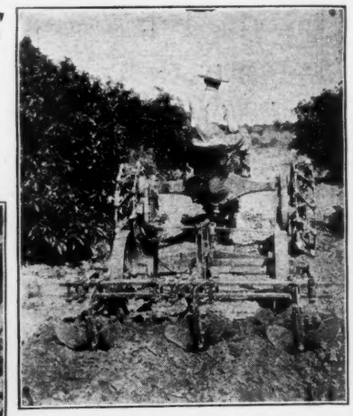
SONG POEM WRITERS—"REAL" PROPOSItion. Hibbeler, D-96, 2104 N. Keystone, Chicago.

WHAT THE CAMERA SEES

AMERICAN FRUIT GROWER MAGAZINE will pay Five Dollars for the photo selected each month as the PRIZE PHOTO, and will pay One Dollar each for other photos not receiving the prize money but which we are able to use. Send your photo, illustrating anything of interest to the fruit grower, with a short item telling the FACTS about the picture. Address photos to the Editor. If not suitable for our use, your photo will be returned.

All that is left of this original Grimes apple tree, which died in 1899, is a gavel made from its wood and presented to the West Virginia Horticultural Society. (See article in this issue.)

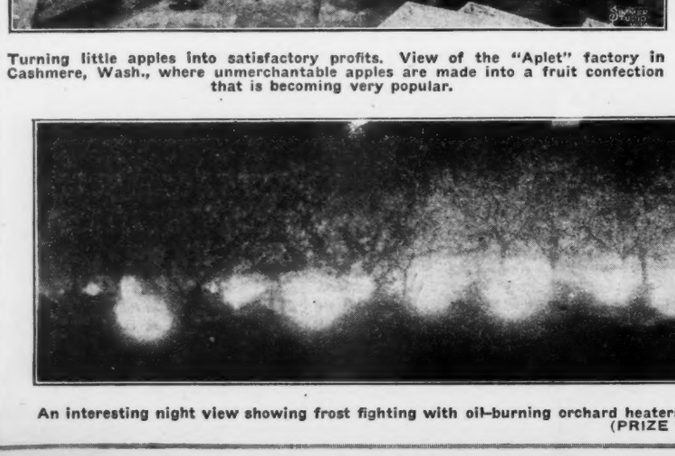
Another "largest grpae vine," growing on Roanoke Island, N. C. This "Scuppernong" is generally conceded to have been planted by Sir Walter Raleigh's colonists in 1585–1587, which would put its present age at 342 years. It is still a vigorous grower, its trunk is larger than a man's body, it covers over an acre of ground and yields from one to two tons of grapes annually, according to H. E. Zimmerman, who sends the picture. (PRIZE PHOTO.)



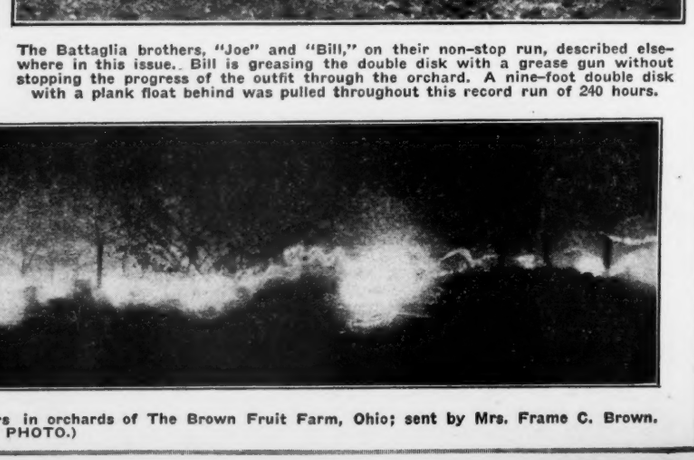
Orchard cultivator with irrigation attachment, drawn by tractor in orchard of F. W. Kibby, near San Juan, Texas. The trees are planted 70 to the acre.

Thousands of pickers flock to Door county, Wisconsin, to pick the 10 to 15 million pound cherry crop. Picture taken in orchard of D. E. Bingham, Sturgeon Bay, by Conrad L. Kuehner, University of Wisconsin.

Dusting as a supplementary control has given very satisfactory results — clean foliage and fruit—in the Scarff Orchards, Ohio.



Turning little apples into satisfactory profits. View of the "Aplet" factory in Cashmere, Wash., where unmerchantable apples are made into a fruit confection that is becoming very popular.



The Battaglia brothers, "Joe" and "Bill," on their non-stop run, described elsewhere in this issue. Bill is greasing the double disk with a grease gun without stopping the progress of the outfit through the orchard. A nine-foot double disk with a plank float behind was pulled throughout this record run of 240 hours.

An interesting night view showing frost fighting with oil-burning orchard heaters in orchards of The Brown Fruit Farm, Ohio; sent by Mrs. Frame C. Brown. (PRIZE PHOTO.)

American Fruit Grower Magazine for August

Volume XLIX — AUGUST, 1929 — Number 8

THE VARIED activities of the United States Department of Agriculture have proved so uniformly helpful and so indispensable to Agriculture that the present "Grape Consumption Survey" must be set down to misdirected zeal, rather than to a perverted sense of humor on the part of the Department officials responsible for inspiring the "survey."

Gathering Misinformation About Grape Consumption

Representatives from the Department of Agriculture are making house-to-house investigations in various cities, interviewing housekeepers, to determine the various forms in which grapes are consumed.

"It has been learned thus far," says the press dispatch, "that but a very small portion of the grape crop is utilized in fermented wines." Dear, dear, dear! Is there a soul so credulous as to be able to read this "information" without a smile of complete understanding?

"Mrs. Housekeeper," inquires the bright young Investigator, "What do you do with the grapes you buy?" With stifled trepidation she conjures up every possible use to which grapes may be put. Except one.

"Do you make any wine?" persists the soulful enquirer, and "Oh, Heavens, No!" responds the terrified woman, her mind dismayed by visions of the "5 & 10" law.

At eve she greets her husband's return from the shop, office or factory with a harrowing tale. "A Federal officer was here today, John! He asked a lot of questions about what we did with all those grapes you bought last fall, and tried to find out if we were going to make wine again this year. And I told him 'No.' And, John, we simply won't *dare* to make any wine. They'll watch and see who buys grapes, and we won't *dare* to buy more than a basket at a time, and not very many, at that."

Were it ever wise, from the standpoint of the welfare of the grape industry, to make a survey such as the one now under way, the present time is most inopportune. A reduced grape crop will shortly be seeking a market. This short crop, by very reason of its limitation, might bring more money, gross to the grower, than have previous heavy crops. Provided, of course, the normal demand persists.

But if, for any real or fancied reason, the consumers are frightened out of buying grapes, the grape grower is certain to suffer. Surely the Department of Agriculture officials have not forgotten the lesson of the Pittsburgh fiasco of a few short years ago.

While the grape season was at its height, and thousands of cars were rolling, Federal prohibition officers interfered with the sales of grapes from cars in the Pittsburgh terminal. Cars of grapes piled up, unsold, in the terminal markets, while the price of grapes sank below the cost of production.

Even though the grape associations and shippers secured a fairly prompt abatement of the nuisance, the market reflected the blunder the rest of the season. The grape industry was scuttled and sunk for that year.

An endeavor to examine into the grape purchases of a representative cross-section of the population, by any Department of the Federal government, is almost certain to be misunderstood by the consumers. But little dependence could be placed on the information so secured and its value for any helpful purpose would be exactly nothing, net.

As long as the possibility exists of doing an injury, rather than a benefit to the grape industry, surveys of this type should be postponed—indefinitely.

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NO OTHER "B" battery is built like an Eveready Layerbilt. It is the most economical and reliable of all Evereadys. It contains *flat* cells, an exclusive, patented Eveready invention that has saved money and given new convenience and reliability to millions of "B" battery users during the past three years.

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Now look at the diagram of a typical cylindrical cell "B" battery. See the waste spaces. Count the solderings—2 per cell, 60 in all. Look at the delicate fine connecting wires—29 of them. That makes 89 chances for trouble!

Let these inside facts about "B" batteries guide you. Buy Eveready Layerbilts next time. Look for the name on the label.

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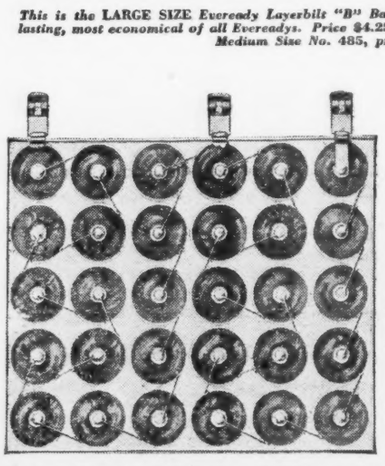
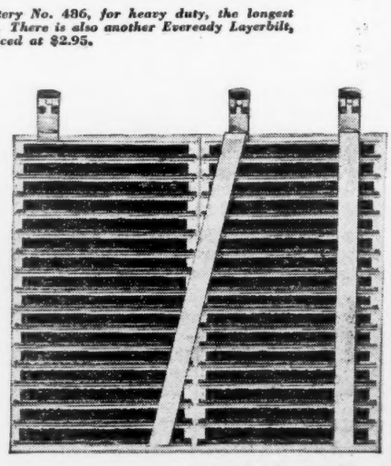


Here is the inside story about every "B" battery assembled of separate, individually sealed cells—29 fine connecting wires, 60 solderings, and lots of waste space.



Here is the inside story of the Eveready Layerbilt—flat, space-saving cells making connections automatically. Only five solderings, only two broad connecting bands, maximum reliability, maximum active materials, greatest life. Layerbilt construction is an exclusive Eveready feature. Only Eveready makes Layerbilt Batteries.

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WHY NOT "FEDERATE" the FRESH FRUIT INDUSTRY?

A Proposal to Merge Existing Fruit Trade Associations Into One National Fruit Federation, with Representation from State Horticultural Societies, to Work Out a National Program to Increase Consumption of Fresh Fruits and to Meet the Problems of Production and Distribution.

By E. S. BRIGGS

Secretary-Manager, American Fruit and Vegetable Shippers' Association

THE CLOSING paragraph of the article, "Fruit and Vegetable Schedules in the Hawley-Smoot Tariff," in the July AMERICAN FRUIT GROWER MAGAZINE, contains a thought well worthy of studious consideration. "Practical co-operation of . . . . producers, handlers and shippers, working in unison in the development of a single program, *and standing solidly behind that program* . . . . " pictures a situation that must spell more prosperous conditions for any group capable of achieving that stage of co-operative action.

Would it not be both wise and desirable at least to give serious study toward working out a broad, general program designed to effect such "practical co-operation in the fresh fruit industry?

Producer and Shipper and the "Fresh Fruit Market"

The entire fresh fruit industry prospers, or fails to prosper, according to the condition of the market for fresh fruits. An active, growing market is always a profitable market, while a sluggish demand as related to supply spells loss for the entire industry. It will be seen that in the fresh fruit "industry" I am including all who are engaged in growing and marketing fresh fruits. This comprises the producers, the shippers and the distributors or "receivers." Their major interests must always be identical. In fact, their functions are so interwoven that often it is difficult to tell just where one class leaves off and the others begin. To illustrate:

By "producers" we always mean the growers. Very well. But many growers are shippers, and when growers form marketing associations they too become shippers. Many growers take up the production of smaller orchards to ship with their own and are recognized in the "rating books" as shippers. Some of the larger growers' organizations, such as the California Fruit Growers' Exchange (citrus), the Florida Citrus Exchange and the California Fruit Exchange (deciduous) basically producers' organizations, not only ship their members' products but are extensively interested in distribution. On the other hand, American Fruit Growers, Inc., is a shipper, distributor and grower corporation with its own brands which it extensively advertises. This concern, one of the largest shippers, has also immense holdings in orchard lands to augment its needed supply of high grade fruits for its distributing organization. These are but a few examples that serve to illustrate how the functions and interests of the producers, shippers and distributors are interwoven.

Many problems affect alike each "division" of the fresh fruit industry. To mention but a few, there are transportation, railroad rates and service, embargoes, market extension, both domestic and export, insect and disease control, the spray residue problem, standardization of grades, improvement of containers, legislation affecting the industry, and the education of the general consuming public to the value of fruit as food. As these and other problems of equal importance are met and solved, the prosperity of the fresh fruit industry will be enhanced.

> *"Taking the country as a whole, the existing personnel of the directorates of the state horticultural and other fruit growers' societies provides the finest type of representation, in thought and interest, that the American fruit grower could possibly secure.*
>
> *"Were these societies each to select men from their respective boards of directors or executive committees, to meet annually in conference, a national expression could be given to the voice of the American fruit grower.*
>
> *"Were these delegates to meet with the shippers and distributors in the proposed fruit trade federation, adding their counsel to the deliberations and serving on all important committees where programs are created, the fruit industry could speak with one voice and act as a unit on all matters concerning the industry."*

There are now four separate organizations of shippers and distributors: the American Fruit and Vegetable Shippers' Association, the International Apple Shippers' Association, the National League of Commission Merchants, and the Western Fruit Jobbers' Association.

The membership of the first-named organization is composed very largely of individuals and organizations who assemble the original car-lot shipments of fresh fruits and vegetables. Most of the larger grower-owned, co-operative organizations are members, and representatives from these organizations are prominent in the directorate of the association and on its many committees.

The International Apple Shippers' Association, as its name implies, concerns itself chiefly with matters affecting the distribution of the apple crop.

The two last-named organizations are composed largely of distributors, the jobbing and commission houses. Although there is some overlapping or duplication of membership, the National League of Commission Merchants covers the eastern half of the United States while the Western Fruit Jobbers' Association generally covers the West. Many individuals and firms in the fresh fruit and vegetable trade hold membership in all four associations.

The aims and purposes of the four organizations are so nearly identical that many members of each organization have frequently discussed the merging or "federating" of the four into one national organization.

The First Step Taken

At the eleventh annual business meeting of the American Fruit and Vegetable Shippers' Association, held at the Stevens Hotel, Chicago, in January, 1929, President S. A. Gerrard gave expression in his opening address to an argument for a federation, laying stress upon the greater efficiency and economy that would result from such a union.

After a thorough discussion, the Resolution Committee brought before the convention a resolution instructing the Board of Directors to give careful consideration to the proposal and, if found practical, to take a referendum of the entire membership on the proposal. This resolution was adopted and the question submitted to the membership in February. The returns from the referendum stood: for the proposed federation, 518; against, 13; doubtful, 2.

Following the compilation of these returns, the directors instructed President Gerrard to impart the results of the referendum to the presidents of the other three organizations with the request that they, too, submit the proposal to a referendum of their respective memberships. The prospects for favorable referendums on the part of the membership of the other organizations, after this matter is further discussed between their leaders, appear very favorable.

Following such looked-for favorable action by the associations under discussion, there remains only the formation of the working structure of the new organization.

The new organization would be a national federation of growers, shippers, jobbers and commission men, and would operate to promote and protect the interests of the entire fresh fruits and vegetable industry. Its program should be broad—to foster scientific research into the problems of production and distribution; to continue the work of the existing organizations in establishing equitable trade relations and customs; to study market preferences; to promote and encourage standardization in grades and packages; to develop and extend the domestic and foreign markets; to represent the industry before legislative, administrative (including rate-making) and judicial bodies; and in all other proper ways to promote the prosperity of the growers, shippers and distributors of fresh fruits and vegetables.

Four or five days each year could be devoted to an annual convention instead of approximately four weeks as at present, coupled with the enormous expense incident thereto because many are obliged to attend all four conventions.

The various groups or divisions would attend the "section" meetings, there to thrash out problems affecting distinct divisions of the industry. During or just prior to the convention committees representing all interests would discuss, frame and propose to the general sessions the various details of a broad, workable program for the ensuing year. Such a program, improved by general debate, would become the working program of the entire federation; one which all could unitedly support.

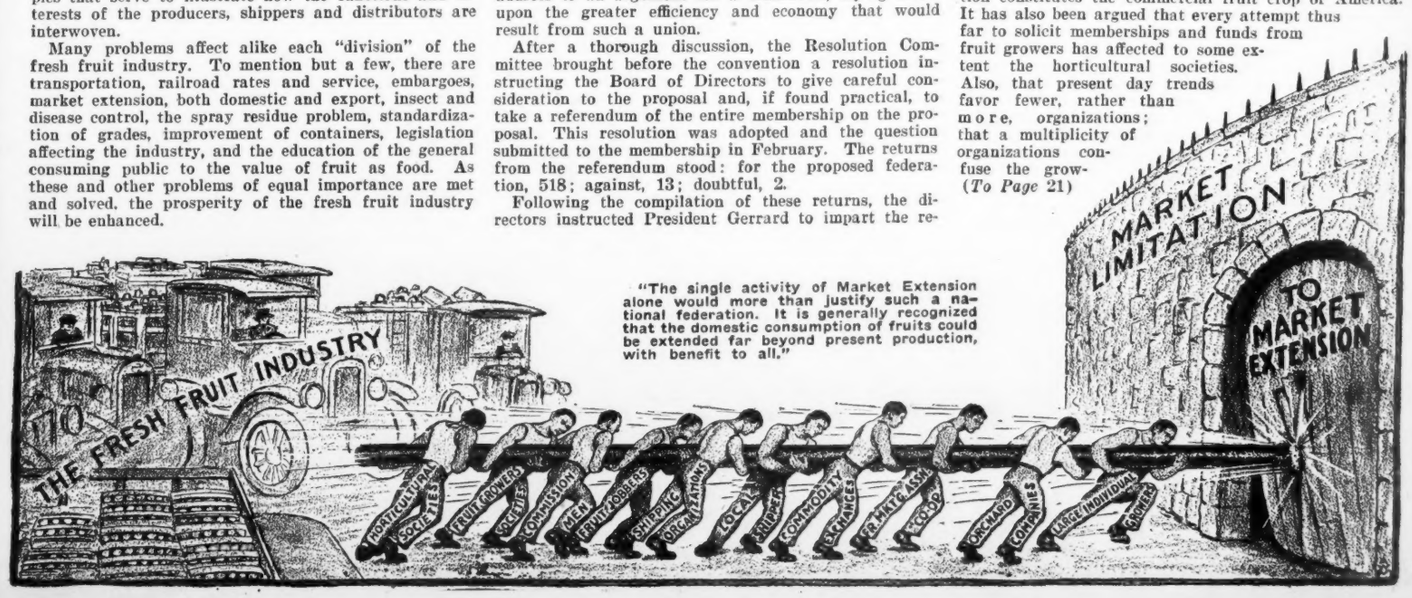
Producers Need Representation

But to perfect such a national organization or "federation" of the fruit industry without more adequate representation of the growers would, in the opinion of many, result in an imperfectly balanced structure. While we are building, we should build well and for permanence.

It has been argued that the producers are represented through their "co-ops" in the American Fruit and Vegetable Shippers' Association. This is true only in part. They are represented primarily as shippers. Problems continually arise in the industry where the voice of the grower, as a grower, should be heard. The grower, whether he be large or small in capital, operations or tonnage, should be represented, if the proposed federation is to represent the entire industry.

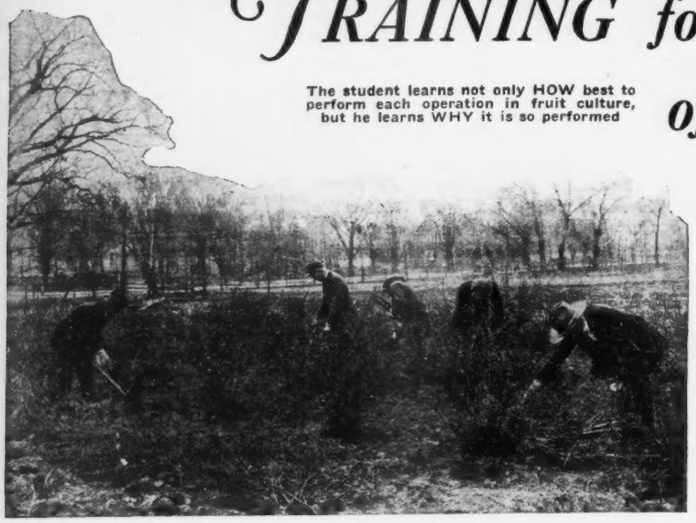
The objection has been raised that it is impossible to organize the great body of fruit growers whose production constitutes the commercial fruit crop of America. It has also been argued that every attempt thus far to solicit memberships and funds from fruit growers has affected to some extent the horticultural societies. Also, that present day trends favor fewer, rather than more, organizations; that a multiplicity of organizations confuse the grow-

(*To Page* 21)



"The single activity of Market Extension alone would more than justify such a national federation. It is generally recognized that the domestic consumption of fruits could be extended far beyond present production, with benefit to all."

TRAINING for the BUSINESS of FRUIT GROWING



The student learns not only HOW best to perform each operation in fruit culture, but he learns WHY it is so performed

By J. J. TALBERT

University of Missouri

"There Is Nothing More Practical for the Fruit Grower Than an Agricultural College Education, Because It Can Be Turned Into Financial Gain and Into Achievements of Civic Honors. Better Still Is the Opportunity for Unselfish Service to the Community, to the State and to the Nation."

KNOWLEDGE is power. The colleges of agriculture are equipped and organized to teach students the best methods of conducting profitably fruit growing enterprises. Few fully appreciate the great opportunities presented. There has been accumulated in the agricultural colleges most of the knowledge of the best fruit growing practices developed by the training and experience of the most successful fruit growers. To this is added all the knowledge which has been accumulated through the most careful and painstaking scientific research. Moreover, this accumulation of knowledge upon the business of fruit growing has been systematized, organized and placed in teachable form and thus made available to students. In the colleges of agriculture, therefore, all this knowledge may be received through the teachers, laboratories and libraries.

The fruit growers of the future must, more than ever before, be able to think clearly and accurately. Their training must not only include fruit growing, but they must have a knowledge of social movements, agricultural economics, government and a wide fund of information upon other important subjects. This is necessary for the independence and prosperity of all our agricultural enterprises.

Objectives of Agricultural Education

Perhaps two outstanding purposes or objectives of an agricultural education are: first, the consideration of public policy and the national welfare, and, second, the need for increasing the farmer's efficiency through education. These objectives are fundamental because the art of agriculture produces food and clothing—all civilization is builded upon these primary needs.

The most important single industry in the world is agriculture, or the production of agricultural crops. In America, the agricultural industry is the largest in respect to the amount of money invested and the income received. Moreover, the agricultural industry is largest with respect to the number of people employed, and it is still capable of very great extension and development.

No more valuable element exists in our population than the agricultural group. It is certainly the most conservative, dependable, steadfast and democratic. The agricultural population may be depended upon to provide not only the fundamental needs, food and clothing, but also to produce a large portion of the leaders of industry.

What Does Your College Offer?

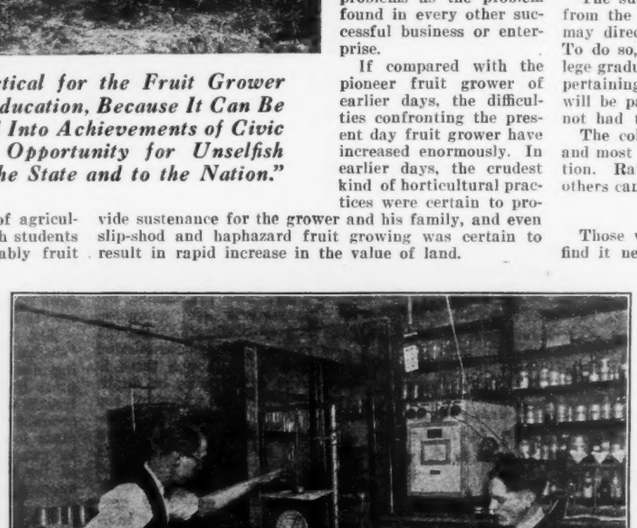
There is an Agricultural College in your State, supported by public taxation, to serve you. It offers a thorough training at a moderate cost. This cost will prove the best investment you can make if you plan to make fruit growing your business. A list of these colleges appears on page 14 of this issue, together with the address from which you can secure detailed information as to what YOUR college offers to you.

Business of Fruit Growing

The occupation of fruit growing is one in which the home and the business are closely associated. It is for this reason that the average American farmer has been contented until recently to run his business without profit. His farm has furnished him a home and for the most part a comfortable living. Of his small investment, he has taken little account.

The decade prior to 1890 was an era of cheap land, but the days of cheap land are past. The fruit grower of today is a user of capital, which must pay, besides other fixed charges, interest and dividends, if he is to succeed and stay in business. This necessitates applying the same principles to his problems as the problem found in every other successful business or enterprise.

If compared with the pioneer fruit grower of earlier days, the difficulties confronting the present day fruit grower have increased enormously. In earlier days, the crudest kind of horticultural practices were certain to provide sustenance for the grower and his family, and even slip-shod and haphazard fruit growing was certain to result in rapid increase in the value of land.



The usual outcome was that if the fruit grower could manage to hold on to his land for a number of years, he was certain of some increase in wealth, because the land was sure to increase in value.

Land values have now approached a point where a reasonable income has become difficult to obtain. It is also true that the land, in general, is less fertile after many years of cultivation. Insects and diseases have in many cases increased in severity.

These facts and others, of course, will serve to impress upon the present and future fruit grower the fact that he must become more efficient, that to succeed he must use better methods than the pioneer fruit grower. He cannot afford to make mistakes. He must possess a great variety of horticultural facts which were unknown to the pioneer fruit grower or he cannot succeed.

Fruit Growing Highly Specialized

The production of fruit crops differs from the production of grain crops or live stock in that it is a much more highly specialized industry, requiring, therefore, specialized knowledge. The man who is able to grow any fruit crop successfully will generally find the business profitable and interesting. There is always a market and a good sale for high quality apples, pears, peaches, grapes, strawberries and the like. On the other hand, the grower who has a medium or inferior product may have difficulty frequently in handling his crops on a paying basis.

The successful fruit grower must know his business from the ground up, or from A to Z, in order that he may direct and manage efficiently those in his charge. To do so, it may be necessary for the agricultural college graduate to spend considerable time in all the work pertaining to the management of a fruit farm. This will be particularly true of a city reared boy who has not had the advantage of farm training.

The college man is not too good to do the smallest and most disagreeable task connected with fruit production. Rather, it is he who can and will do that which others cannot or will not do.

General Training Needed

Those who succeed in the business of fruit growing find it necessary to know something about field crops, as when to plant, what to plant, how to prepare the soil, when and how to fertilize, cultivate, harvest, etc. They must also possess a knowledge of livestock—how to feed, house and care for horses, cattle, hogs and the like. They must, of course, know what fruits will thrive under local conditions of soil and climate. An acquaintance with the various problems of insect and disease control and prevention, as well as soil adaptations, planting, cultivating, fertilizing and harvesting and marketing must be understood.

In fact, there are many other questions equally as important as those mentioned upon which the fruit grower must be informed. He must possess not only horticultural information but a broad agricultural training along all lines of crop production. Is it not, therefore, proper and right to think of the business of fruit growing as requiring a college training, just as we think of the necessity of a college training for the lawyer, doctor, or the business executive?

Not a White Collar Job

When discussing the direction and management of the operations connected with the production of fruit crops and the delegation of such work as plowing, pruning, spraying, fertilizing, building fences, planting and harvesting crops to those who are not competent and trained to manage and direct, some are sure to say that the colleges of agriculture are training boys for white collar (*To Page* 14)

Accuracy in observation is taught in laboratory and orchard. Above, taking and recording data regarding the ripeness of apples through use of the pressure tester. Below, making and mixing spray materials preparatory to spraying

The Rogue River Valley Pear Industry

A pear picking scene in the Rogue River Valley

Rogue River Valley, Oregon, Is the Most Extensive Pear Producing Region in the Northwest, Where Thousands of Carloads of Pears Are Annually Packed and Shipped to the Markets of the World. How the Crop Is Produced and Marketed.

By W. L. TEUTSCH

Assistant County Agent Leader

THE MOST extensive pear producing district in the Northwest is in the Rogue River Valley, which centers around Medford, Oregon. It is on the slopes of this valley, nestling between the foothills of the Cascade range on the east and the Coast range on the west, where last year nearly three thousand carloads of pears were produced, and where this year there is now in the process of harvesting and packing some thirty-six hundred carloads, the bulk of which will tickle the palates of consumers two thousand to three thousand miles across the continent.

"It's a great country," as the slogan reads on signs along highways up and down the valley, and in the official literature. Indeed it is a great country—for fish as well as for pears, for it is here in the Rogue River, on the banks of which pear orchards are located, that the Steelhead trout, the gamiest of all fish, raises to the fly. It is here that Herbert Hoover came and where others of the country's notables come to enjoy the scenery and to test their ability in piscatorial affairs. But this is a story of pears and not of fish.

There are 10,272 acres of pears in this district, of which 7726 acres are now in bearing. The Bartlett is the leading variety, making up 3383 acres, the Bosc second with 2825 acres, and the D'Anjou third with 2075 acres. Winter Nelis is running a poor fourth with 871 acres, followed closely by Comise with 542 acres. The remaining acreage consists of Howell, Seckle, Patrick Barry, and Old Home-Kieffer.

Production is gradually increasing. Since 1923 the number of carloads shipped out has increased from 2019 to 2811 last year, or an increase of 39 per cent. Already this year 1200 carloads of Bartletts have been shipped, and the total production is expected to reach the 3600 carload mark when the late varieties are all harvested and sent on their way to market. It is expected that within the next few years, at present rate of expansion, that production will more than double.

While the Bartletts are now the leading variety, there is more and more a tendency to increase the production of the late varieties such as D'Anjou and Bosc, varieties which stand storage and are put on the market for the winter trade. This year 600 carloads of Bartletts went to canners on the coast, while 600 were shipped to eastern markets. The growers netted about the same whether they marketed to canners or shipped.

The Rogue River Valley Fruit Growers League, of which H. Van Hoevenberg is president, himself owner and operator of a 150 acre orchard, is the strong service organization of the district. It is this association that deals with all traffic problems, suggests problems in research to the local Experiment Station, and directs the type of service rendered by the local county agricultural agent and fruit inspectors. It was this association, in co-operation with the Oregon State Agricultural college, which was able to bring calm out of chaos when the arsenical residue regulations were put into effect by the Bureau of Chemistry in 1926.

It is difficult to describe the conditions which prevailed in this district when the order went out that all food products must carry not more than one one-hundredth gram of arsenious oxide per pound. The fight against coddling moth in this district had been well waged and the six or seven applications of lead arsenate spray which it was necessary to apply to get control thoroughly covered the pear surface. Wiping was tried, and still a large proportion of the pears did not come within the tolerance. No washing machines had as yet been developed, and out of a blue sky growers were told that they must meet the requirements or their crop could not be marketed. With a year's labor at stake, and an investment in the crop ranging around $150 per acre, and in the aggregate an income of around three million dollars jeopardized by this regulation, one can easily realize the consternation that was caused among shippers and growers alike.

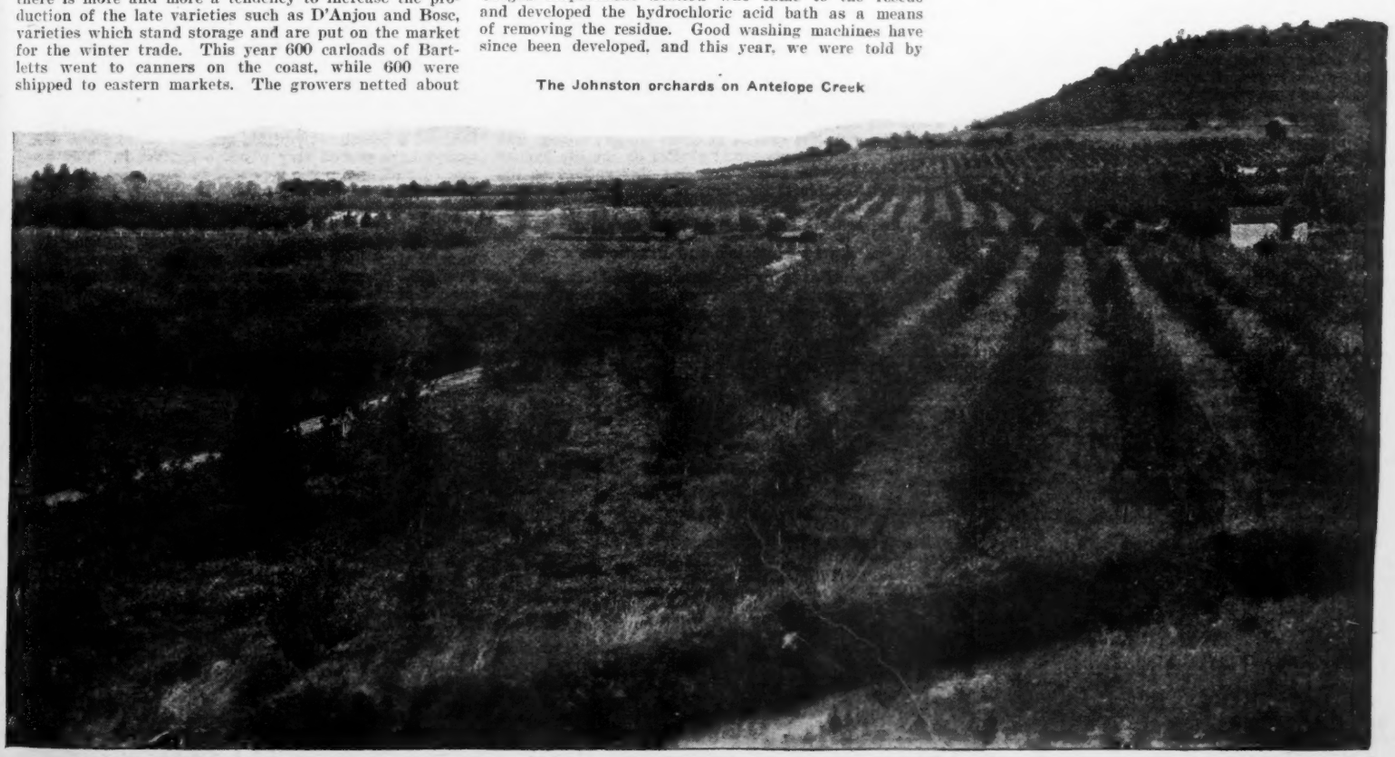
Out of it all has come an improved method of handling the pear crop. It was Henry Hartman of the Oregon Experiment Station who came to the rescue and developed the hydrochloric acid bath as a means of removing the residue. Good washing machines have since been developed, and this year, we were told by packers and shippers, Rogue River pears are moving to market practically 100 per cent clean, this hydrochloric bath enabling them to keep the arsenious acid content below the tolerance for export of one one-hundredth gram per pound.

"In fact, the necessity for washing, thought for a time to be a calamity to the industry, is now considered by many as an asset and a blessing. There are four specific advantages in washing with a hydrochloric acid solution: first, the washing machine speeds up the output of the packing plants and reduces hand labor requirements; second, washing improves the appearance of the fruit by removing all dust and dirt, leaving the fruit perfectly clean with the natural bloom on it; third, the core temperature of the fruit is reduced by from eight to ten degrees as a result of washing with cold water, followed by cold air drying, thus reducing the cost of precooling by several per cent; fourth, the hydrochloric acid solution kills all coddling moth eggs which are on the fruit at the time of washing. This prevents these eggs from hatching into worms, which later cause fruit stings. At the Talent Experiment Station only one egg out of 150 was found to hatch after being subjected to the hydrochloric acid bath.

That proper washing with hydrochloric acid solution does not impair the keeping quality of the fruit has been proven by the Oregon Experiment Station. This, too, was testified to by the E. W. J. Hearty Company of Medford, extensive packers and shippers of pears. Last year this company put 139 carloads of washed fruit into storage. Six hundred boxes of this fruit, taken at random from the 139 cars by Federal inspectors, were carefully examined. Out of the 600 boxes, only three rotted pears were found. Various concerns estimate the cost of washing at a cent and a half per box. It is thought that after the first overhead is absorbed that this cost can be reduced to at least a cent per box, the cost being much more than offset by the advantages.

The new Bean washer is really a remarkable machine. The fruit is subjected to an acid spray which comes both from above and below, as it passes through the washer. From this it goes to the (*To Page* 20)

The Johnston orchards on Antelope Creek



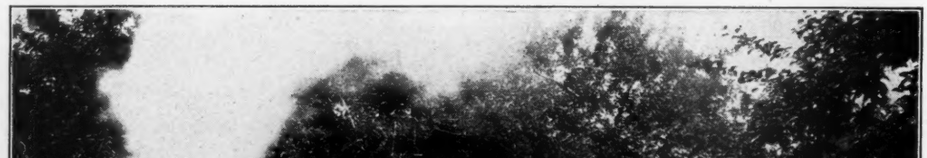
Scientific Research in Spraying Aids Massachusetts Growers

THE MASSACHUSETTS Agricultural Experiment Station, as far as its personnel and funds will permit, is attempting to meet the problems confronting the many and varied agricultural enterprises of the State. Along horticultural lines especially, its situation allows it to render considerable service.

The station located in the Connecticut River Valley, the tobacco and onion growing section of the State, is naturally devoting much attention to those particular industries. It is also in close contact with the extensive fruit growing regions in the western counties.

The sub-station at Wareham is directing its energies upon the problems of cranberry culture, practically all of which industry is concentrated in the Cape Cod region.

The field station at Waltham is located in the heart of the market garden region surrounding Boston. It is also in a convenient position to serve the great fruit growing region of eastern Massachusetts. Recent legislation has made provision for additional staff and equipment to undertake research in floriculture.



Careful experimental work has shown that dusting apples for late season pests involves less danger of arsenical residue than does spraying

The Massachusetts Agricultural Experiment Station Has Established an Enviable Record for Progress in Developing and Testing Materials and Methods Promising Greater Effectiveness in the Control of Insects and Diseases Affecting Fruit Crops.

By A. J. BOURNE
Massachusetts Experiment Station

Approximately 60 per cent of the projects upon which the station is engaged are concerned with different phases of crop production, crop protection, and allied chemistry. These include the research in agronomy, vegetable and landscape gardening, as well as that concerned with fruit growing. The projects in crop protection include those relating to the study of diseases and insect pests and the development of measures for their control. In this group experimental work on insecticides and fungicides, and their behavior under Massachusetts conditions, naturally occupies a very prominent position.

The activities of the station also include research in animal industry (animal husbandry, dairying, poultry husbandry, etc.), economics, farm management and crop utilization and preservation.

Horticultural Research Important

The importance of research in horticulture, in the program of the station, is indicated by the fact that approximately 33 per cent of the total appropriation is devoted to the support of the departments whose work is directly related to different phases of that subject.

This group embraces the investigations in various branches of pomology, as well as the greater part of the activities of the Cranberry and Market Garden Field Stations. Naturally, a large proportion of the research in plant physiology and pathology and in entomology is directly concerned with problems in horticulture: such, for example, as the study of downy mildews of cucumber and lettuce, the causative fungi and their relation to environment; soil fumigation for nematode control, for the protection of greenhouse vegetables; the effect or benefit of artificial light upon winter bloom of gladiolus; Alternaria leaf-spot of carnations, the cause of the disease and its control or prevention; leaf mold of greenhouse tomatoes; the various root rots of tobacco, especially the relation of soil reaction and crop rotation to these diseases; the control of onion thrips; biology and control of garden cutworms; studies on the life history and control of the carrot rust fly; observations on the so-called onion blast; the study of various weather conditions as predisposing factors; effect of cultural practices and benefits to be derived from spraying.

Spray Materials and Practices

On the study of spray materials and practices, particularly those relating to fruit crops, investigations are being conducted covering many different phases of the subject. These include several major projects of the station.

One of the most important is the study of the plum curculio, as a pest of apples in Massachusetts, the most serious insect pest of apples in the State. In many orchards it causes more damage than all other insect pests combined. This investigation was begun in 1926. Especial attention has been given to the adaptation of the spray schedule to give maximum protection. Studies of different spray materials and combinations have been made, as well as various measures of orchard practice designed to supplement the spray program.

The Arsenical Residue Problem

The problem of arsenical residue with especial reference to its bearing on spray practices in Massachusetts has been studied during the last three seasons. Many of the serious insect pests are active during mid or late summer, relatively close to the time of harvest. This necessitates late application of sprays. The project has for its chief objective the determination of the latest date arsenical sprays may be applied without leaving an objectionable amount of residue at harvest. Standard varieties of apples representative of Massachusetts conditions have been used in the tests. The important bearing of rainfall on the problem has been studied. The possibilities of dusts to replace sprays, especially in the late season applications, has been given especial attention.

A joint project of chemistry and entomology on a systematic study of oil sprays has been recently undertaken. This involves a study of oils of various grades with reference to their insecticidal value and toxicity to plant growth, to determine the characteristics of the various grades and also the relative value of different emulsifying agents. The endeavor will be made to determine some set of standards for measuring the stability and effectiveness of this type of sprays.

Oil Sprays and the European Red Mite

In spite of the comparatively short time European red mite has been present in Massachusetts, it has established itself very generally over the State and has assumed a prominent position among orchard pests. Oil sprays have proved very effective against it. The demand for oil sprays has increased in direct proportion to the advance of the red mite. Insecticide firms have been eager to reap the harvest thus offered. Consequently, growers have been offered a large number of oil sprays of many types and descriptions. Fortunately, most of these have proved safe, and many of them effective. The attempt has been made by the station to keep abreast of the situation, and to protect the grower as far as possible from those injurious or ineffective.

Typical Scenes at Massachusetts Experiment Station

Left—Spray materials and their various combinations are applied and studied under the conditions and environments that are to be encountered in the commercial orchards

Right—A typical field test of improved equipment and materials, in this case seeking better control of onion thrips

Claims have been made that certain oil sprays will give much greater coverage than will others. The prominent position of oils in the spray program of Massachusetts growers, as well as their relatively high cost, has caused this question to assume considerable importance. Several standard oil sprays now offered on the Massachusetts market have been tested for their comparative coverage. These oils were representative of the different types now in general use, so that the data could be obtained, should superiority of coverage, if any, prove to be a matter of type rather than of particular brand.

At the present time considerable stress is being laid on the possibility of combining certain fungicides with some of the oil sprays. Under certain conditions this is undoubtedly an advantage, particularly where control of disease demands an application during the dormant or delayed dormant period. Several standard commercial oil sprays have been used in such tests, to check upon their compatibility with copper or sulphur fungicides. Stone fruits as well as apples were included in the tests. Particular attention was given to the toxicity of such combinations, and whether addition of the fungicides impaired the effectiveness of the oils against European red mite.

Reducing Spray Injury

Foliage burn often follows the application of the combined spray of lead arsenate and lime-sulphur. In some cases injury has been so extensive that many growers have substituted somewhat less effective fungicides because they would be less toxic to foliage. Aluminum sulphate added to combination of calcium arsenate and lime-sulphur has been highly recommended as a means of reducing spray burn. This material is being given a trial the present season. The tests are chiefly on Baldwin, a variety which burns very easily. It is also being used on McIntosh, a variety very susceptible to scab, to note whether its use impairs to any extent the fungicidal value of the spray.

Tests along similar lines are being made of the value of adding iron sulphate to the common lead arsenate-lime-sulphur combination. The very favorable results experienced from the use of this material in the Middle West tend to make this a welcome addition to spray practices, provided it will give equally satisfactory results under Massachusetts conditions. There is sufficient scab present this season to furnish ample data on the fungicidal qualities of this combination.

Experiments are being conducted with calcium arsenate combined with lime-sulphur, on apples, particularly on the relative toxicity of this spray compared with that of the standard combination of lead arsenate and lime-sulphur now in use in this State. Similar tests are being made by several of the commercial fruit growers. The results in these orchards will be closely followed.

Dusts Being Studied

The use of sulphur dusts applied to apples during the period of bloom is also being studied in the college orchard this season. The period between the pink spray (just before the blossoms open) and the calyx, is a long one. In Massachusetts this period is often characterized by cold, cloudy weather and frequent rains, conditions which tend to prolong its length and which are very favorable for scab. Moreover, new leaf surface is rapidly developing at this time. This needs protection from disease. Careful observations were made on trees so dusted to note the protection afforded from scab. Consideration was also given to the question of the effect of such a practice upon the activities of the bees visiting the open blossoms, and the consequent set of fruit on such trees.

The substitution of a dust schedule for sprays throughout the season is being followed in a block of young peaches. The possibilities of avoiding or lessening the danger of spray injury on the tender new growth offered by this program are being checked, as well as its relative efficiency from the standpoint of insect and disease control.

Tests are being run on the efficiency of the new so-called "quad" nozzles as compared with spray guns, on apples. These nozzles were used in the delayed dormant application of oils as well as in the later foliage sprays. Comparisons are being made both from the standpoint of convenience and rapidity in the application of sprays, and in the relative amount of foliage burn following each method.

New Materials Tested

New materials designed for insect or plant disease control are frequently put on the market. Most of them are proprietary compounds. Usually little is known of their actual composition or behavior.

In any study of spray materials it should always be kept clearly in mind that we are dealing with two forms of life, plant and animal. It is essential, therefore, that any spray material should allow a broad margin of safety between the limits of efficient control of the pest and of toxicity to the plant. In many cases these limits are so close that the material could not be safely used except under the most favorable conditions. The station has tested many of these new and promising materials, as they have appeared.

Such tests are at present being made with various pyrethrum extracts, particularly on more resistant species of insects. Various products designed to serve as activators of nicotine, making possible much greater dilution of nicotine sulphate than at present would be effective, are also being tested.

The protection of fruit in storage from damage by rodents is often a serious problem for the fruit grower. Rats are difficult to poison or trap under such conditions. Preliminary tests have been made to determine the effect of cyanide fumigation upon different varieties of apples under typical storage conditions.

Spray Service to Growers

Supplementary to the direct experimental work in the station orchards, spray service to the fruit growers of the State has been rendered for several years, both for disease and insect control. Scab spores have been trapped and the growers notified when the danger of infection was about to begin. The seasonal development of various insect pests has been followed and advice on the timing of sprays given.

At the request of the Massachusetts Fruit Growers' Association, examination of cull apples was begun in 1927 at several of the large packing houses, to discover the chief causes of culls and the possibilities of remedying them. Noticeable reduction in mechanical injury as a contributing cause of culls was noted in 1928 as compared with 1927, indicating marked improvement in handling. There was a slight reduction in the percentage of culls in 1928, especially in McIntosh, in spite of a season very favorable for scab.

In 1928 an orchard survey was made in the chief fruit growing sections of the State, to determine the success which growers were having in the control of apple pests with the spray schedule now recommended, and whether any significant changes were necessary. Incidentally, it enabled some of the growers to modify their spray programs to fit the local conditions. The advisability of more careful choice of spray materials in some cases was another result of this survey.

The co-operation of the growers with the station in its various activities has been very encouraging indeed, and has contributed very largely to any success thus far achieved.

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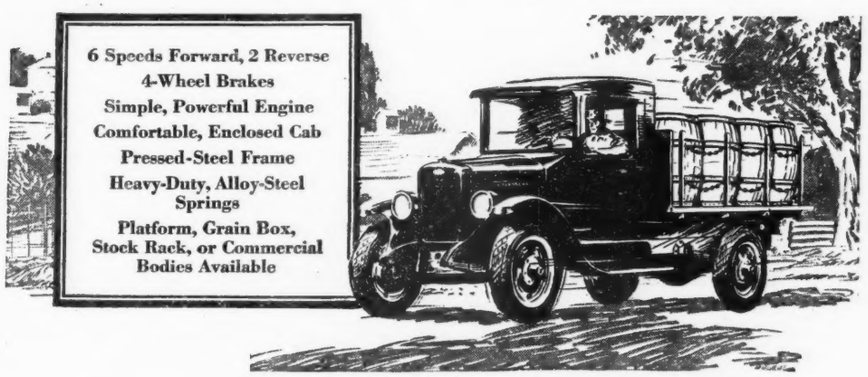

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Insulation adds little or nothing to the cost of construction for Celotex replaces other materials in building. As a heat-stop, an inch of Celotex is as effective as 3 inches of wood, 8 inches of plaster board, 12 inches of brick or 25 inches of concrete.

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Charles C. Teague on Federal Farm Board

WHATEVER apprehension organized fruit growers may have felt over the Agricultural Marketing Act and its possibilities of injury to existing marketing organizations has been very largely dissipated by the appointment to the Federal Farm Board of Charles C. Teague of California. Mr. Teague has been recognized for years as the leading exponent of co-operative fruit marketing, and his appointment had the practically unanimous support of the fruit industry.

Following the receipt of telegraphic congratulations from AMERICAN FRUIT GROWER MAGAZINE on behalf of its readers, Mr. Teague replied as follows:

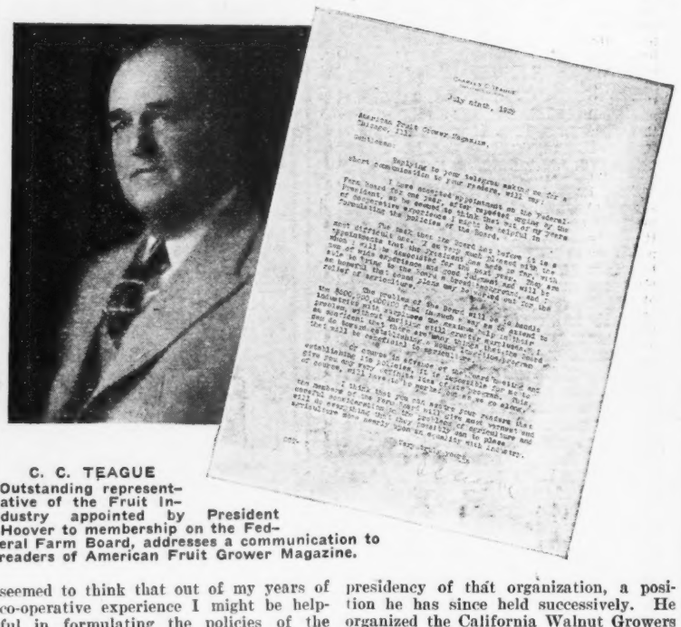
"I have accepted appointment on the Federal Farm Board for one year, after repeated urging by the President, as he seemed to think that out of my years of co-operative experience I might be helpful in formulating the policies of the Board.

"The task that the Board has before it is a most difficult one. I am very much pleased with the appointments that the President has made so far, with whom I will be associated for the next year. They are men of wide experience and good judgment and will be able to bring to the Board a broad background, and I am hopeful that sound plans may be worked out for the relief of agriculture.

"The problem of the Board will be to handle the $500,000,000 fund in such a way as to extend to industries with surpluses the maximum help in their problem, without inviting still greater surpluses. I am confident that there are many things that the Board can do toward establishing a sound, long-time program that will be beneficial to agriculture.

"Of course in advance of the Board meeting and establishing its policies it is impossible for me to give you any very definite idea of its program. This, of course, will have to be worked out as we go along.

"I think that you can assure your readers that the members of the Farm Board will give most earnest and careful consideration to the problems of agriculture and will do everything that they possibly can to place agriculture more nearly upon an equality with industry."



C. C. TEAGUE
Outstanding representative of the Fruit Industry appointed by President Hoover to membership on the Federal Farm Board, addresses a communication to readers of American Fruit Grower Magazine.

CHARLES COLLINS TEAGUE, born in Caribou, Maine, in 1873, moved with his parents in 1882 to Salina, Kans., where he spent his boyhood and youth, supplementing his school work by attendance at a Military Academy. His father, who had established himself in the banking business in Salina, lost all in the collapse of the Kansas land boom. At the age of 18, Charles secured his first business experience in selling out the hardware stock of a defunct Salina business house.

In 1893, Charles moved with his family to Santa Paula, Calif., where he made his debut in the citrus industry as a day laborer. His rise to his present commanding position in the fruit industry has been rapid. He is now president of the Limoneira Company, operating 2000 acres of citrus groves, and holds the same position in a California orchard company, now operating 1650 acres of deciduous orchards. The two companies have a combined capital investment of $6,000,000.

In 1911, Mr. Teague was elected director of the California Fruit Growers Exchange, and in 1920 was elected to the presidency of that organization, a position he has since held successively. He organized the California Walnut Growers in 1912 and has been president of that organization ever since. The delivered value of the products handled by these two organizations amounts to $140,000,000 annually.

Mr. Teague has been a banker for 30 years, is married, and has three children. Among other offices held by Mr. Teague, at the time of his appointment by President Hoover to the Federal Farm Board, may be mentioned: president of the Agricultural Legislative Committee of California since its organization; vice-president and chairman, Agricultural Committee of the California Development Association; director of the Security First National Bank of Los Angeles, and director and past president of American Institute of Co-operation. The honorary degree of Doctor of Laws was granted by the University of California to Mr. Teague in 1924.

Mailing Tube Used as Protector Against Damage by Rabbits

AN ORDINARY cardboard mailing tube, slit open lengthwise, makes a very efficient and inexpensive protector against rabbits doing damage to trees. It is put around the tree very quickly.

Large size tubes can often be procured from stores selling felt base or linoleum rugs, as these generally are rolled on such tubes when they come from the factory. The tubes should be dipped in melted wax.

The picture on page 22 shows such a tube around a tree. If the slit in the tube has a tendency to stand open a string may be tied around it.—*William F. Noe, Iowa.*